DINOSAURS!

•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•

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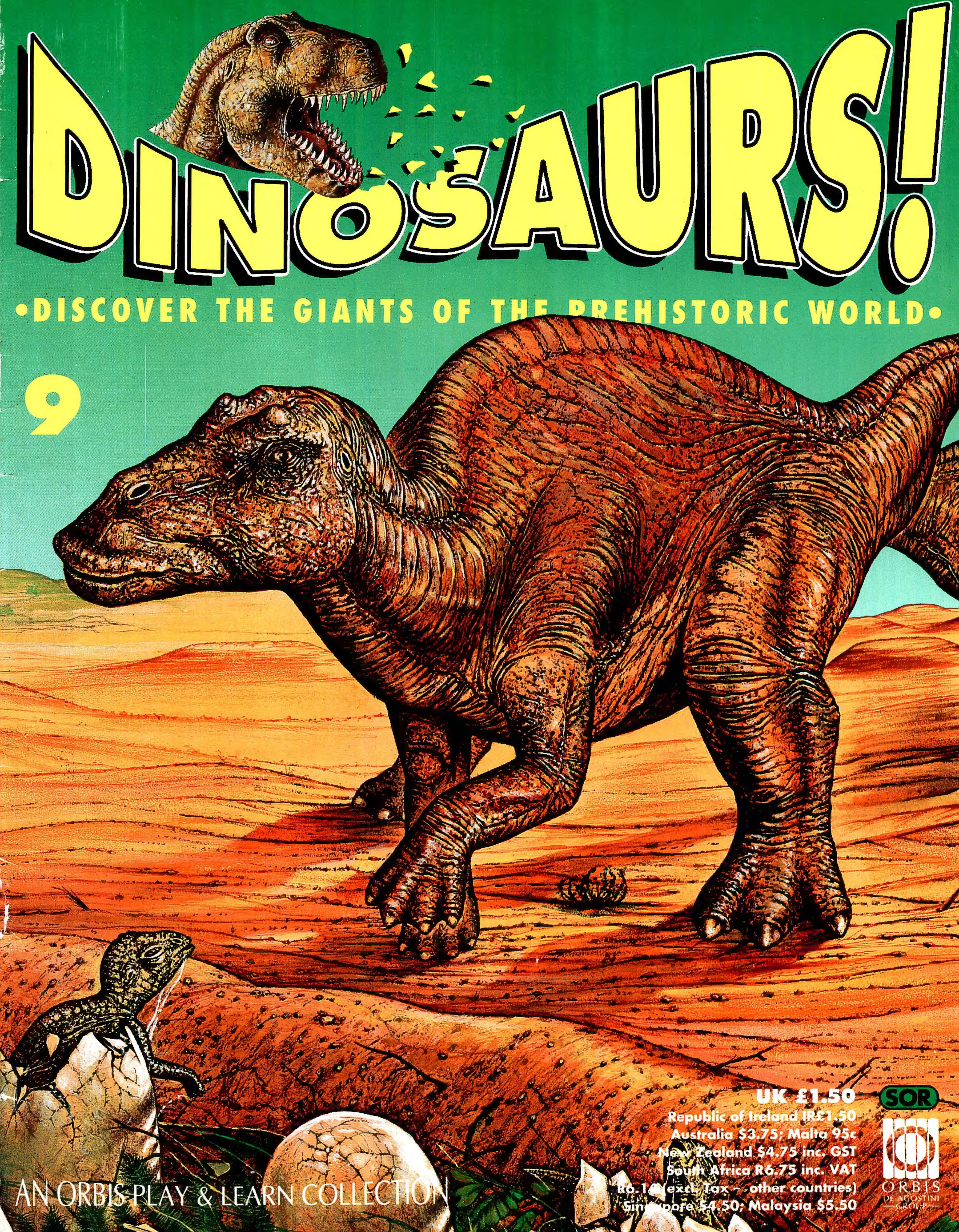

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

IDENTIKIT

Your guide to three more amazing dinosaurs
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WITH THIS ISSUE: START YOUR T REX BODY

With this issue, you get the first parts of *T rex's* body. You've already made a *T rex* skeleton. Now you can build its body. Just assemble the model parts to create your own monster. It's just like a scientist piecing together fossil clues to bring real dinosaurs to life!

The first parts of your *T rex* body are the feet. The legs, arms, body, head and tail will follow. Your model is complete by Part 18 of *Dinosaurs!*. It's really easy to put together – each model part has its own number and there are simple instructions, too. When your model is finished, paint it with model paints to make your *T rex* even more like the real thing.

Just as your *T rex* skeleton stands on its own, so does your *T rex* body model. The choice is yours: you can EITHER build the body around the skeleton OR make the body on its own. One *T rex* or two – how many can you handle?

THIS WEEK'S MODEL PARTS
Model part 1 – Right foot
Model part 2 – Left foot

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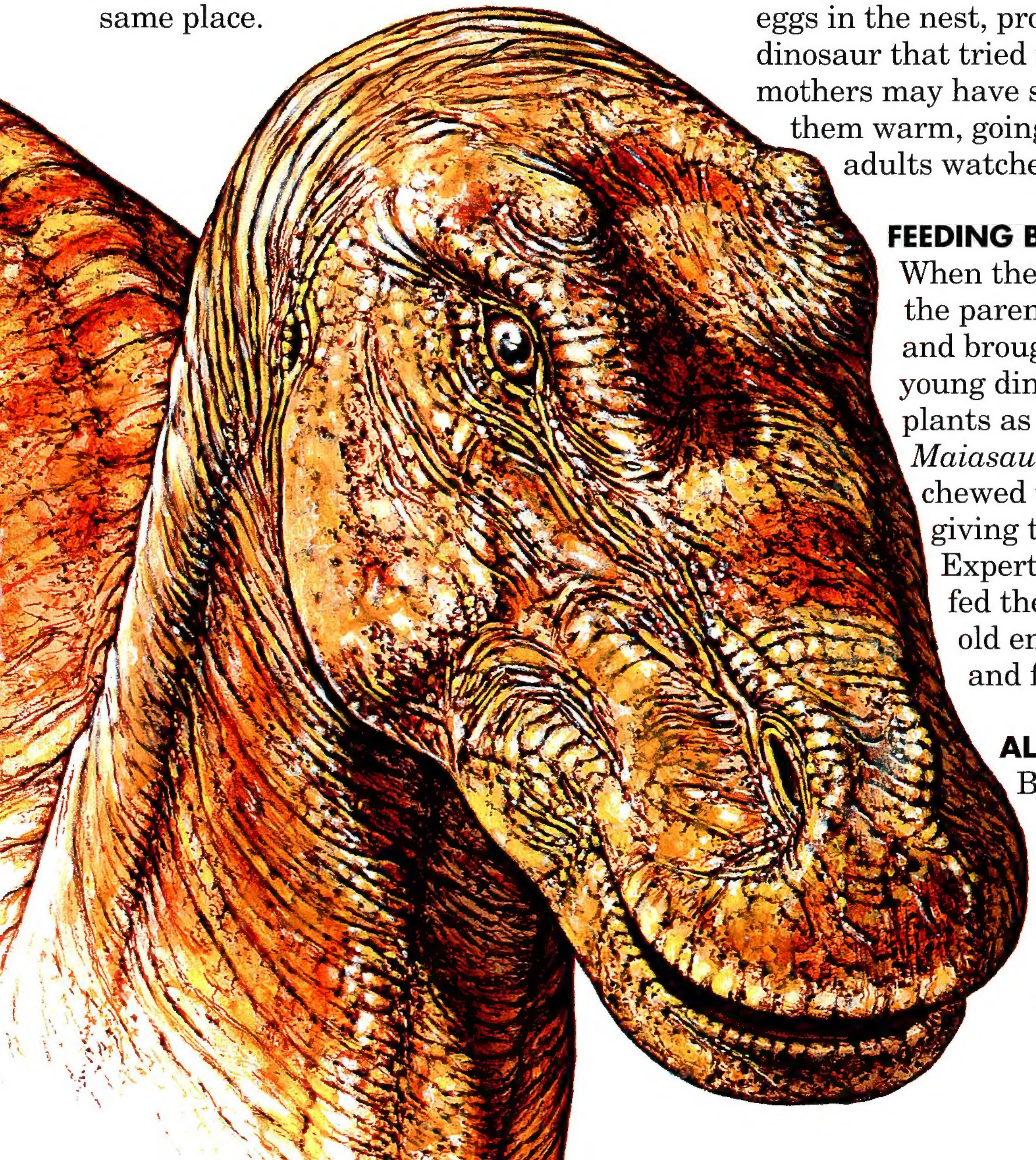
MAIASAURA

***Maiasaura* was named 'good mother lizard' because scientists believe it cared for its young after they hatched.**

In 1979, in Montana, USA, scientists found some dinosaur nests with the skeletons of baby dinosaurs in them – they named the creatures *Maiasaura*. A year before, a single dinosaur nest had been found in the same place.



MUDDY NESTS

The nests were hollows, scooped out of muddy ground, and were about the size of a big, round dining room table. The parents may have lined the nest with soft plants, before the female laid between 18 and 30 hard-shelled eggs in it.

GOOD MOTHERS

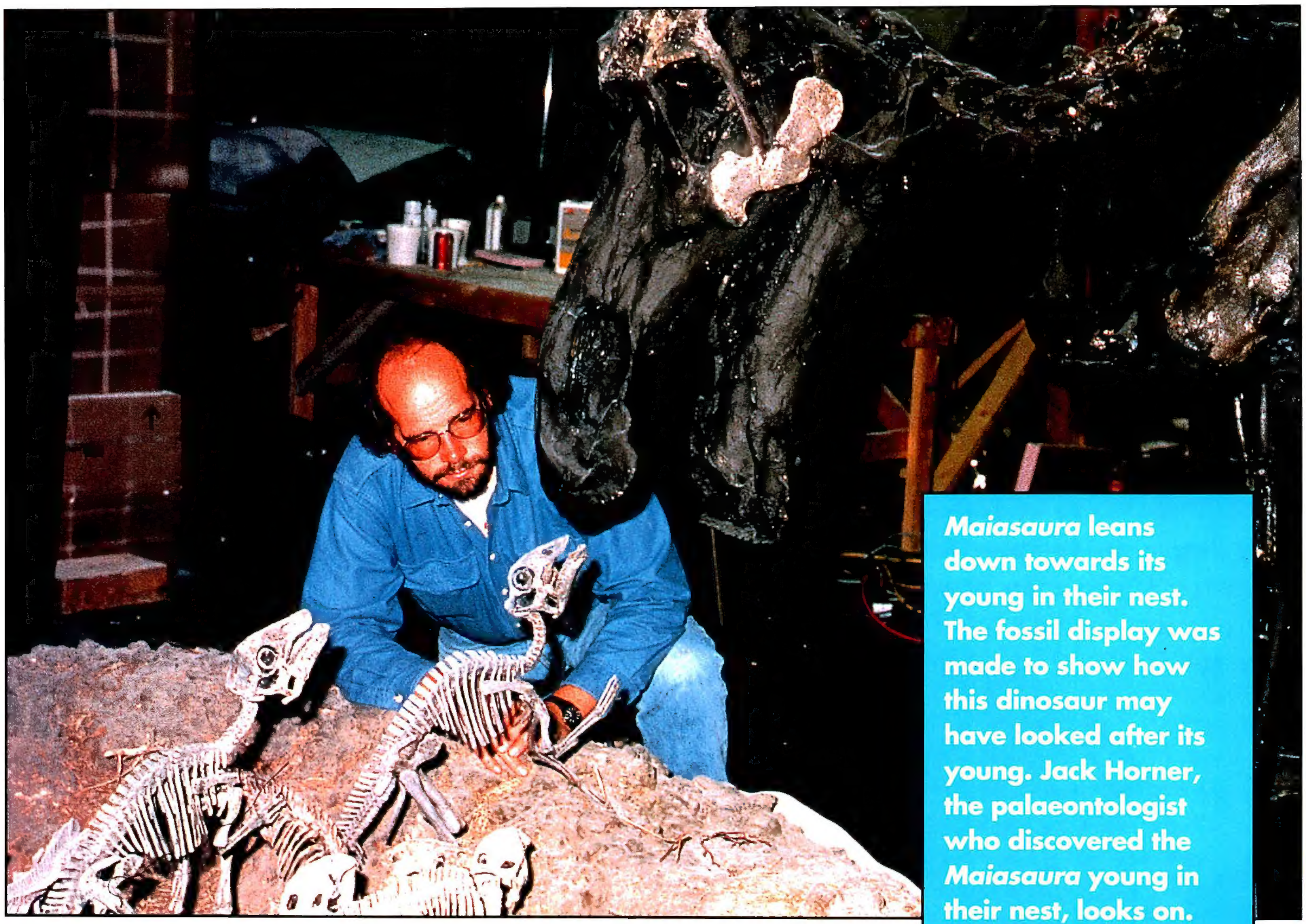
Scientists think that *Maiasaura* mothers, and perhaps fathers as well, guarded the eggs in the nest, protecting them from any dinosaur that tried to steal them. The mothers may have sat on the eggs to keep them warm, going off to feed while other adults watched over them.

FEEDING BABY

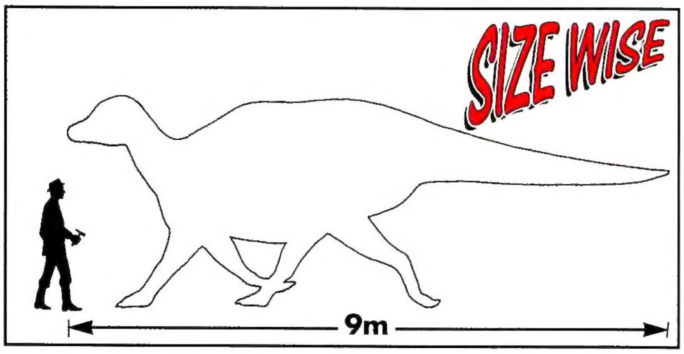
When the babies hatched out, the parents looked after them and brought them food. The young dinosaurs ate all sorts of plants as well as fruit and seeds. *Maiasaura* parents may have chewed up tough plants before giving them to the babies. Experts think that parents fed the young until they were old enough to leave the nest and find their own food.

ALL ALONE

Before these babies were found, scientists thought that female dinosaurs left their babies to hatch out and take care of themselves alone.

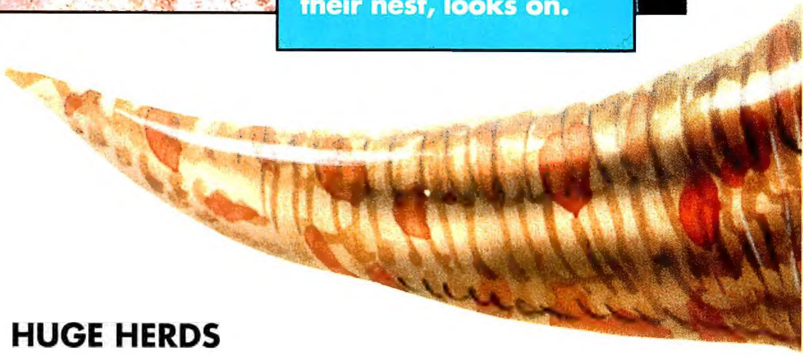


Maiasaura leans down towards its young in their nest. The fossil display was made to show how this dinosaur may have looked after its young. Jack Horner, the palaeontologist who discovered the *Maiasaura* young in their nest, looks on.



MONSTER FACTS

- **NAME:** *Maiasaura* (my-a-saw-ra) means 'good mother lizard'
- **SIZE:** about 9m long and 3m high
- **FOOD:** plants, leaves, fruit and seeds
- **LIVED:** between about 90 – 66 million years ago in the Late Cretaceous in Montana, USA



HUGE HERDS

So many nests with skeletons and pieces of eggshell have been found in one place in the USA that some palaeontologists have suggested huge herds of *Maiasaura* lived in North America. They roamed through the forests, but returned to the same nesting site each year. They probably used the same nests again and again. When the young had grown enough to look after themselves, they stayed with the herd. Eventually, the herd moved on in search of fresh plants to eat.

DUCK'S BILL

Maiasaura was a big dinosaur, about as long as a double-decker bus. It usually walked on its long back legs and had a big, flat tail, which it held out straight. When feeding on the ground it may have rested on its front legs then reared up on its back legs to reach the leaves of trees. The front of its mouth was shaped like a duck's bill. Further back in its mouth were rows of teeth which ground up the plants it cut off with its beak. On top of its head, above its eyes, was a short bony knob.

ESCAPING FROM DANGER

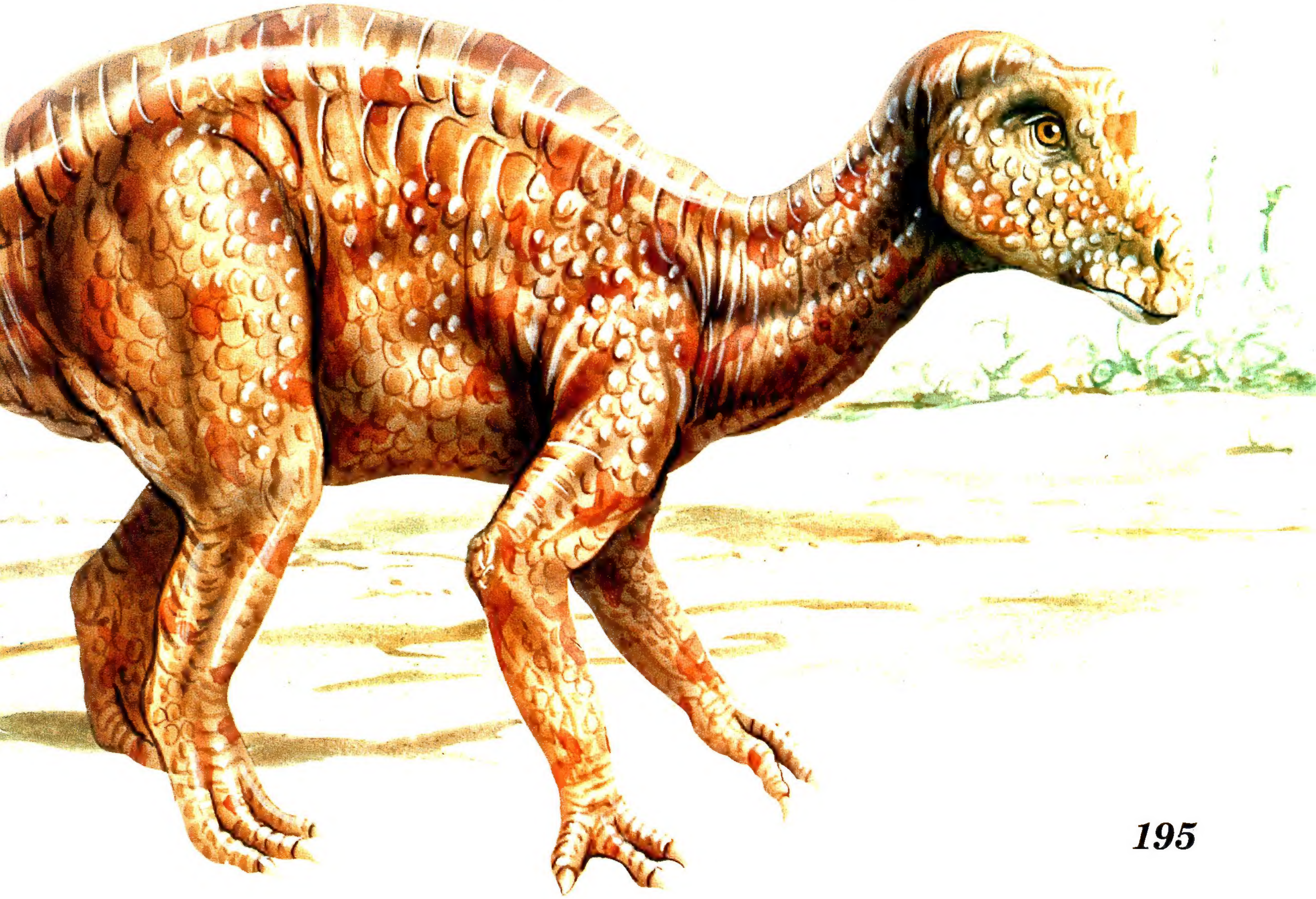
With no way of defending itself, *Maiasaura* probably escaped from the big meat-eating dinosaurs by running away and hiding in thick forests. It probably had good eyesight and hearing, which warned it of danger.

If *Maiasaura* was very frightened, it may have plunged into the lakes or rivers. It swam along by waggling its tail and paddling with its front legs.

IT'S A FACT

EGG MOUNTAIN

When palaeontologists discovered a single fossilized nest of *Maiasaura* in Montana, USA, they decided to excavate the site further. The following year they returned to their dig and found so many nests, packed closely together, that they named the place 'Egg Mountain'.



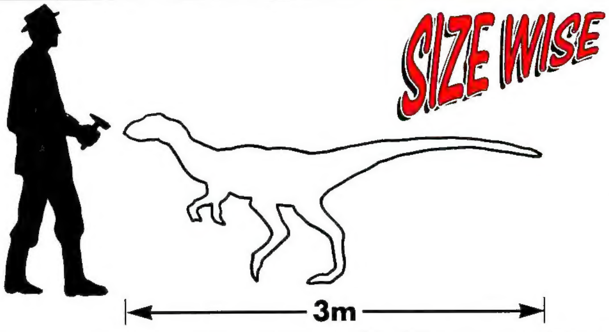
HERRERASAURUS

***Herrerasaurus* was one of the first dinosaurs to roam the Earth.**

About as long as a small car, this dinosaur held its tail high off the ground when it walked. It stood upright, moving about on its long, strong back legs and probably ran very fast to catch its prey.

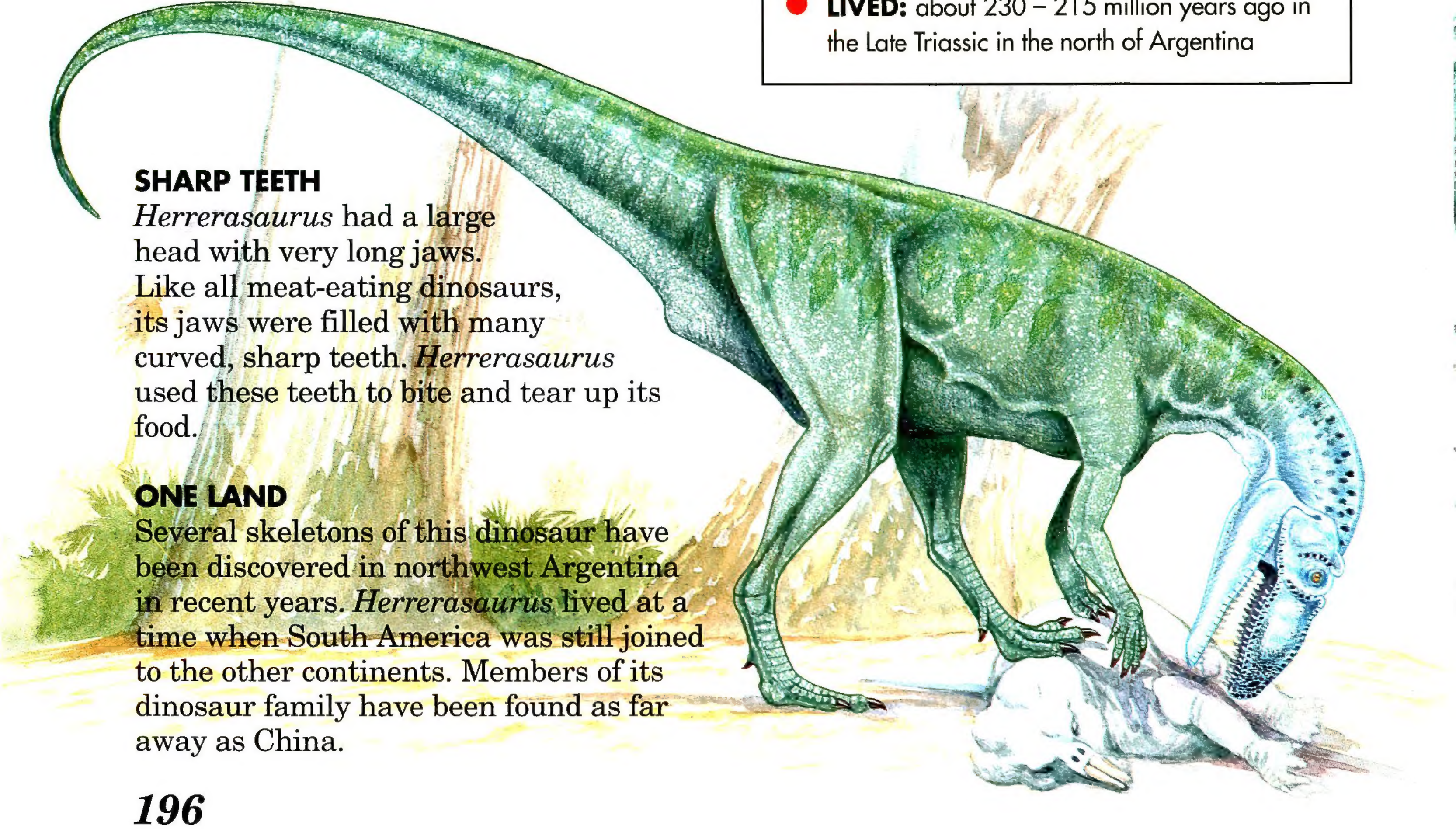
FIERCE KILLER

Herrerasaurus killed and ate mammals, lizards and, perhaps, other small meat-eating dinosaurs. It attacked with its front and back feet, and tore its victim with its long claws. *Herrerasaurus* held its prey in its short, strong front legs.



MONSTER FACTS

- **NAME:** *Herrerasaurus* (herra-ra-saw-rus) means 'Herrera lizard' after the place in Argentina where it was discovered
- **SIZE:** about 3m long and 1m high
- **FOOD:** mammals, lizards and other dinosaurs
- **LIVED:** about 230 – 215 million years ago in the Late Triassic in the north of Argentina



SHARP TEETH

Herrerasaurus had a large head with very long jaws. Like all meat-eating dinosaurs, its jaws were filled with many curved, sharp teeth. *Herrerasaurus* used these teeth to bite and tear up its food.

ONE LAND

Several skeletons of this dinosaur have been discovered in northwest Argentina in recent years. *Herrerasaurus* lived at a time when South America was still joined to the other continents. Members of its dinosaur family have been found as far away as China.

HUAYANGOSAURUS

Experts are still studying complete skeletons to find out more about this armour-plated Chinese dinosaur.

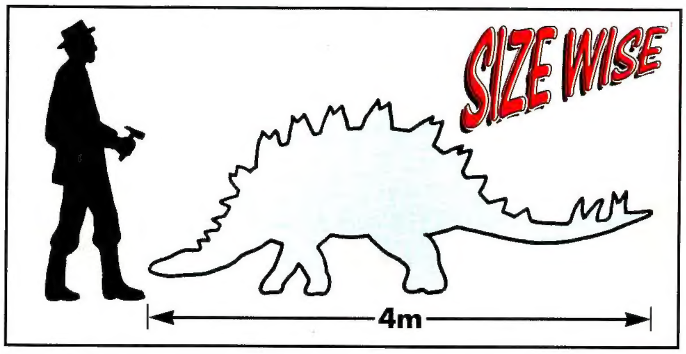
The first fossil skull of *Huayangosaurus* was found in China in 1980. Since then, palaeontologists have discovered more bones, including complete skeletons of this spiny creature.

UNUSUAL TEETH

Huayangosaurus had a square-shaped head and a short snout. It had small teeth at the front of its upper jaw, which it may have used to bite off ferns and other juicy plants. Its jaws were not built for chewing so it probably swallowed the plants whole.

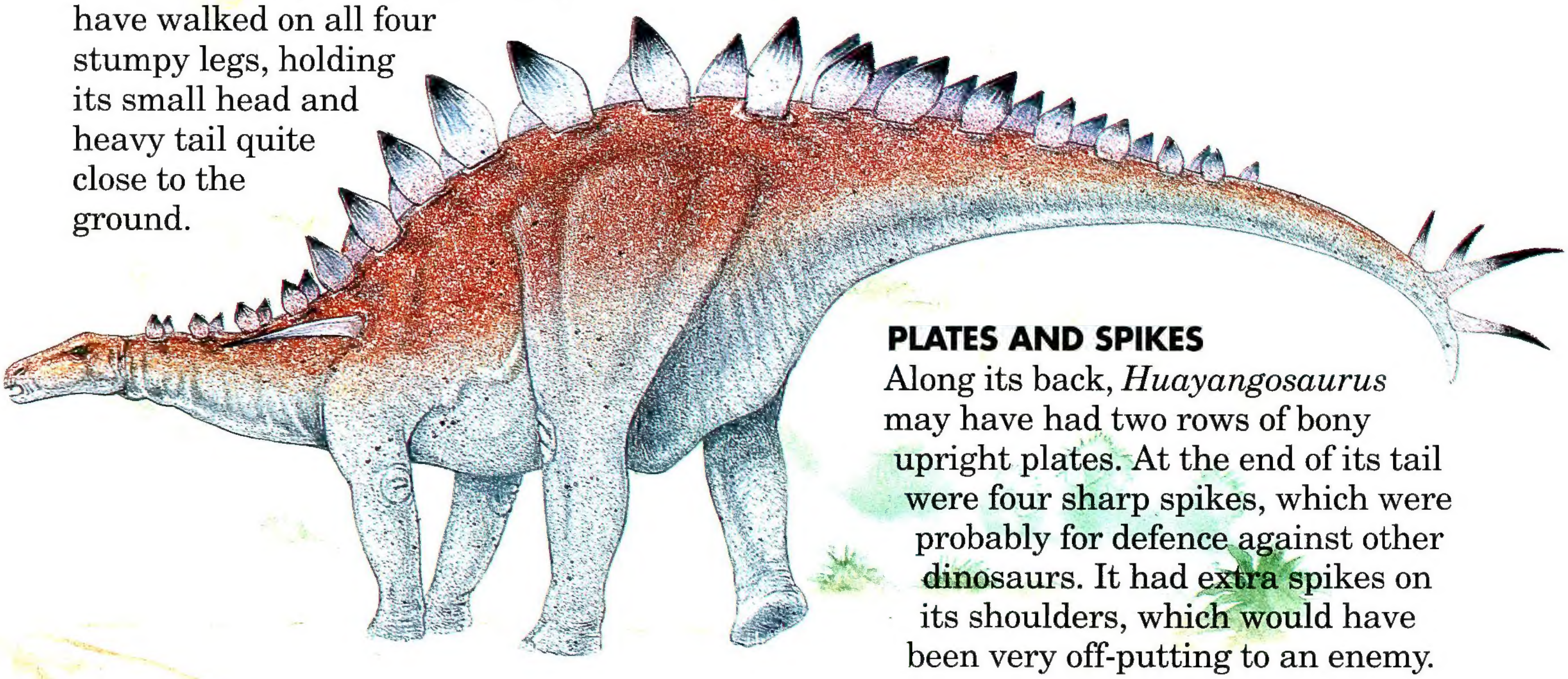
SLOW AND HEAVY

Experts believe that this dinosaur was a slow, lumbering creature. It may have walked on all four stumpy legs, holding its small head and heavy tail quite close to the ground.



MONSTER FACTS

- **NAME:** *Huayangosaurus* (hu-ay-ang-o-saw-rus) means 'Huayang lizard' after the place in China where it was found
- **SIZE:** about 4m long and 1.5m high
- **FOOD:** soft, juicy plants
- **LIVED:** 162 – 148 million years ago in the Middle Jurassic in China



PLATES AND SPIKES

Along its back, *Huayangosaurus* may have had two rows of bony upright plates. At the end of its tail were four sharp spikes, which were probably for defence against other dinosaurs. It had extra spikes on its shoulders, which would have been very off-putting to an enemy.

Reptiles of the air

At the same time that the dinosaurs were leaving their footprints on the Earth, flying reptiles were soaring through the skies.

These distant relatives of the dinosaurs, called pterosaurs (tare-oh-saws), were many different shapes and sizes. Some pterosaurs were as small as sparrows, while others were so large that each wing was as long as a bus. The name pterosaur means 'winged lizard'.

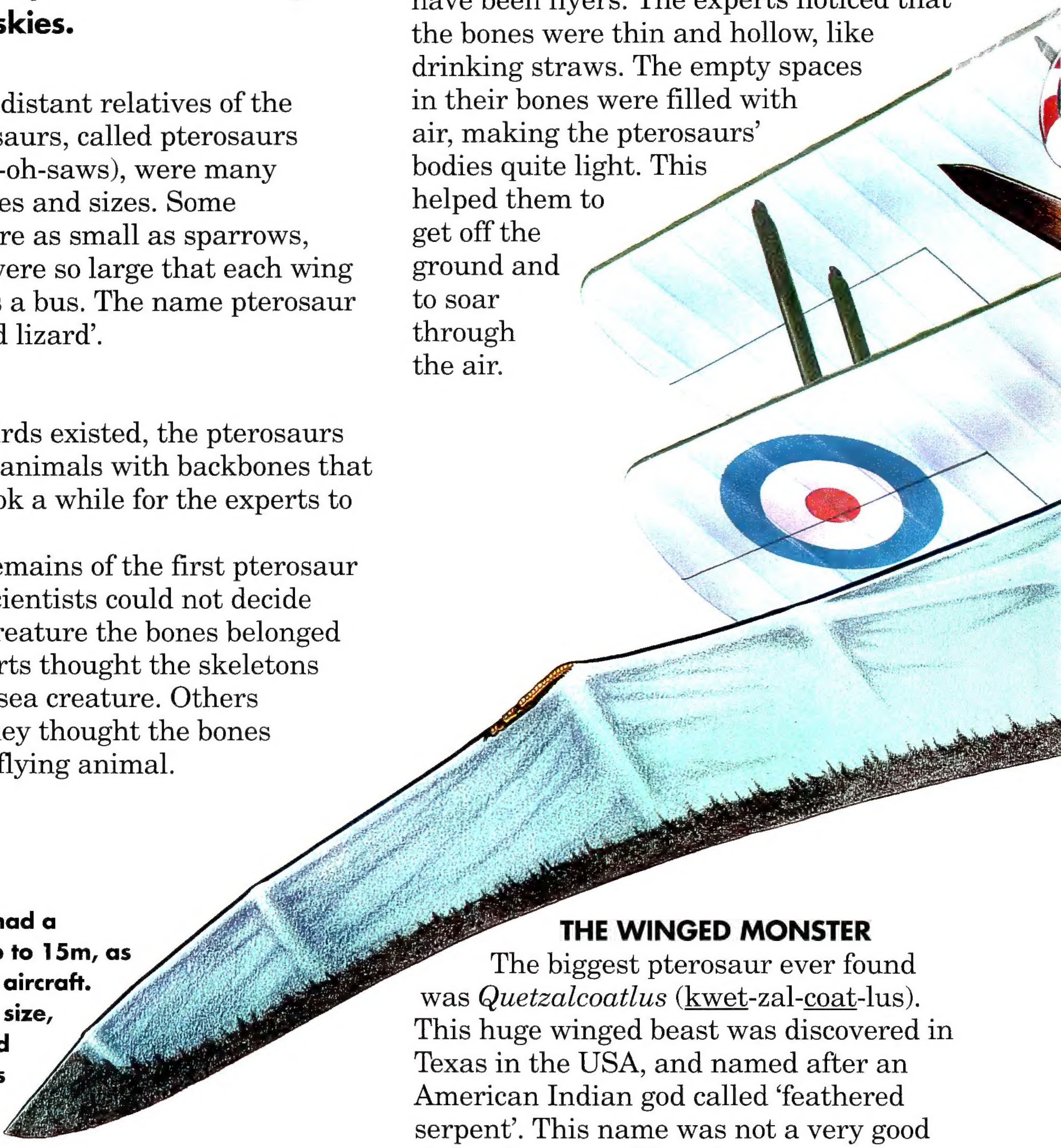
EARLY IDEAS

Long before birds existed, the pterosaurs were the only animals with backbones that could fly. It took a while for the experts to work this out.

When the remains of the first pterosaur were found, scientists could not decide what sort of creature the bones belonged to. Some experts thought the skeletons belonged to a sea creature. Others disagreed – they thought the bones belonged to a flying animal.

LIGHT BONES

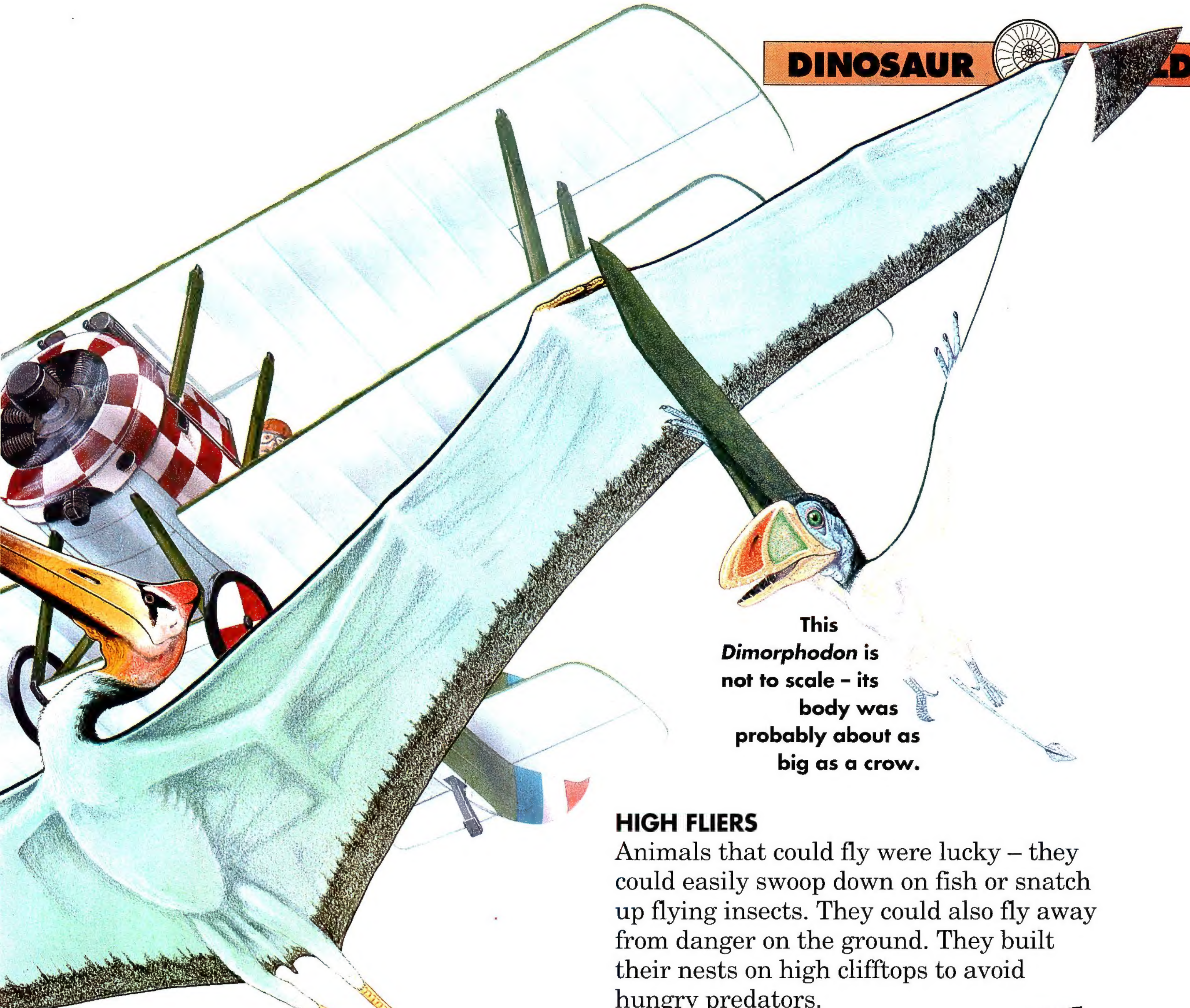
After a closer look at some of the bones, scientists agreed that the animals must have been flyers. The experts noticed that the bones were thin and hollow, like drinking straws. The empty spaces in their bones were filled with air, making the pterosaurs' bodies quite light. This helped them to get off the ground and to soar through the air.



Quetzalcoatlus **had a wing-span of up to 15m, as wide as a small aircraft. Despite its huge size, this animal could soar up on gusts of warm air and may have swooped down to feed on dead animals such as dinosaurs.**

THE WINGED MONSTER

The biggest pterosaur ever found was *Quetzalcoatlus* (kwet-zal-coat-lus). This huge winged beast was discovered in Texas in the USA, and named after an American Indian god called 'feathered serpent'. This name was not a very good choice, because although some pterosaurs may have had soft fur, they never had feathers on their bodies or wings.



This *Dimorphodon* is not to scale – its body was probably about as big as a crow.

HIGH FLIERS

Animals that could fly were lucky – they could easily swoop down on fish or snatch up flying insects. They could also fly away from danger on the ground. They built their nests on high clifftops to avoid hungry predators.

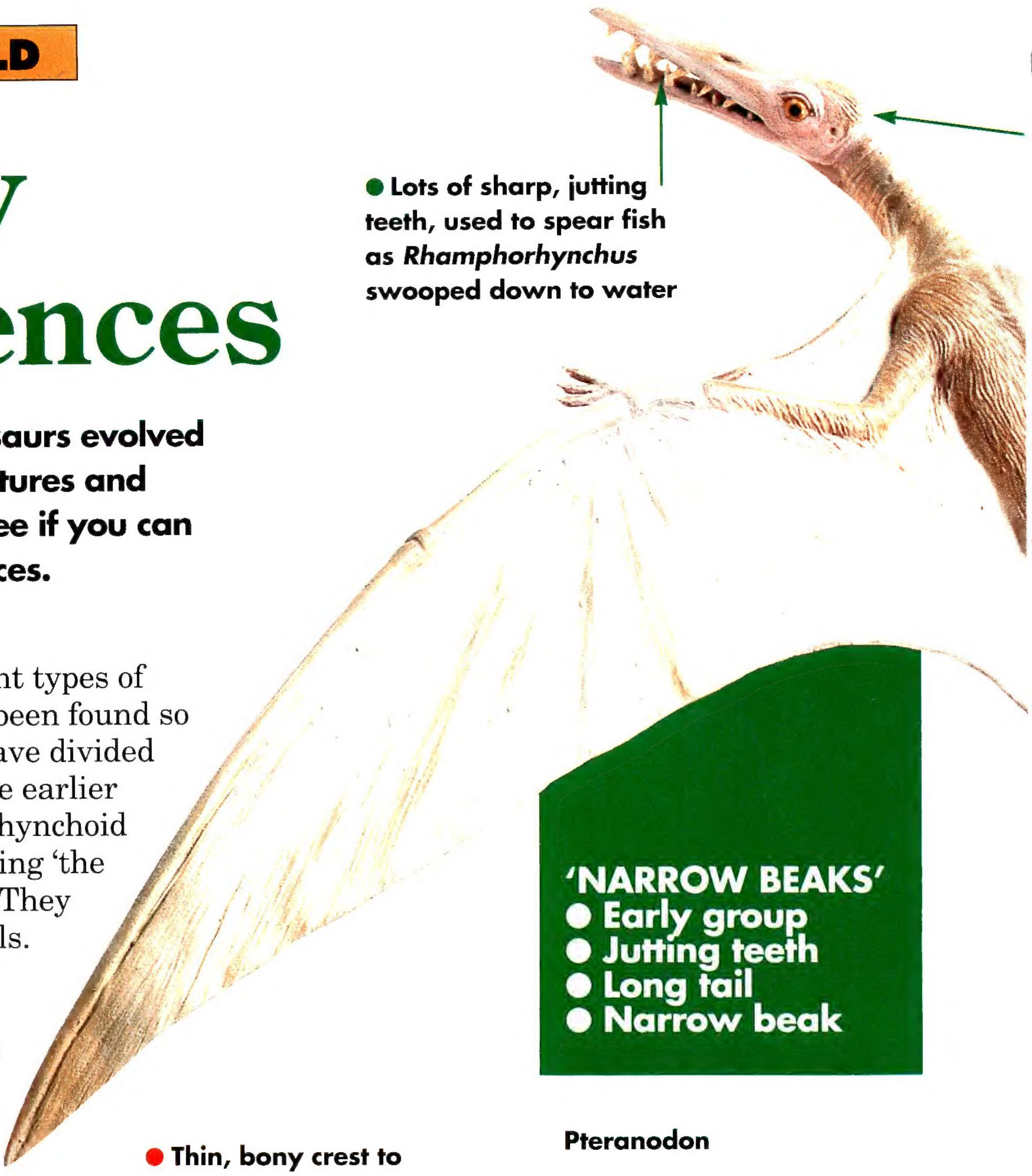
Is it true that pterosaurs had wings made of skin?

Yes. Rather like today's bats, pterosaurs had wings made of skin, stretched tightly between their bodies and the end of an extra long fourth finger. The other three fingers on each 'hand' formed claws on the front of each wing. Bats, however, have fingers that stretch across their wings.

Family differences

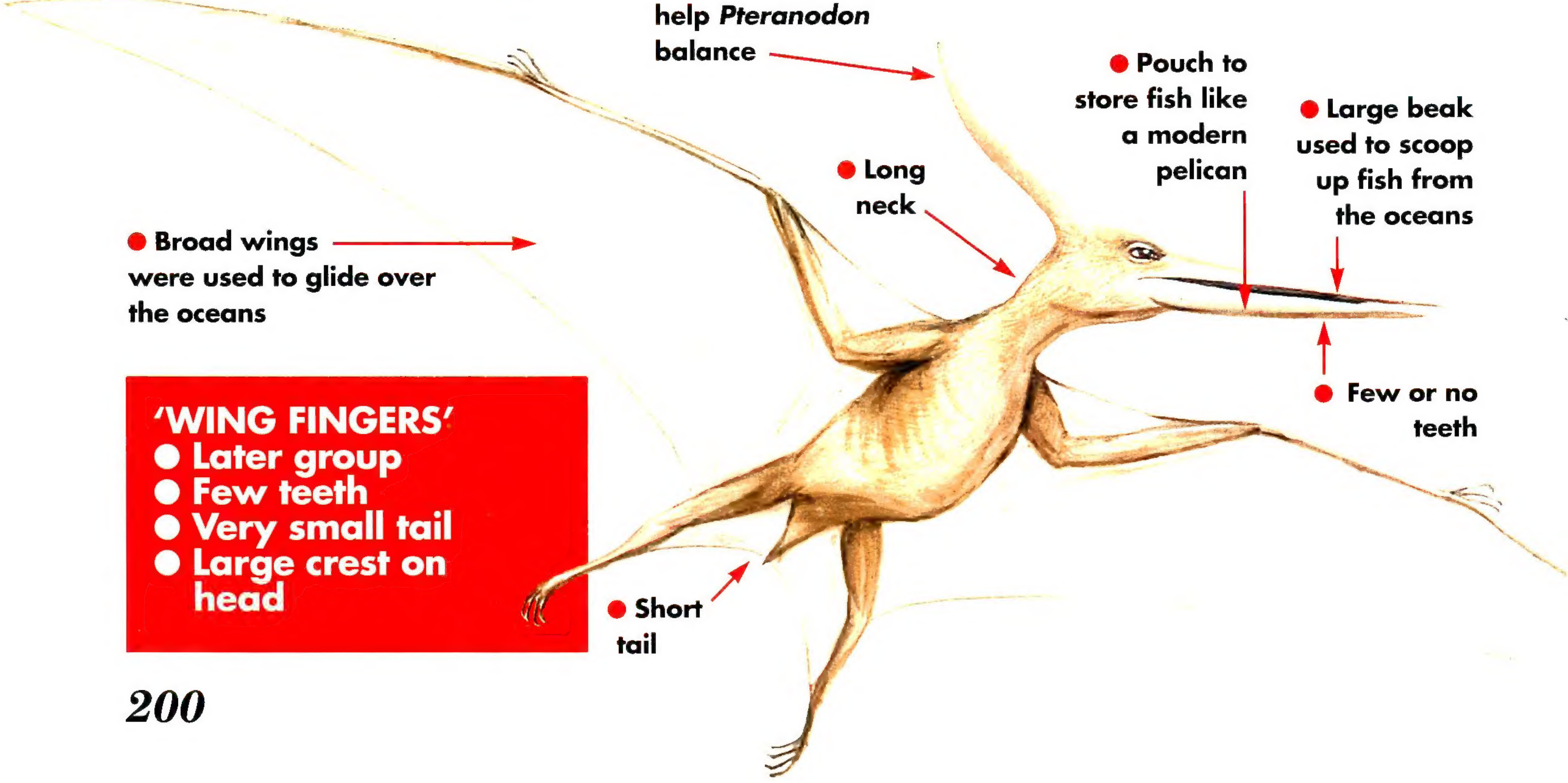
As time went by, pterosaurs evolved into quite different creatures and became better flyers. See if you can spot any other differences.

About 100 different types of pterosaur have been found so far. Scientists have divided them into two groups. The earlier group is called rhamphorhynchoid (ram-for-hin-koyd), meaning 'the type with narrow beaks'. They all had teeth and long tails. The later group is named pterodactyloid (tare-oh-dak-til-oid), which means 'the type with wing fingers'.



● Lots of sharp, jutting teeth, used to spear fish as *Rhamphorhynchus* swooped down to water

'NARROW BEAKS'
- Early group
- Jutting teeth
- Long tail
- Narrow beak



Pteranodon

● Thin, bony crest to help *Pteranodon* balance

● Pouch to store fish like a modern pelican

● Large beak used to scoop up fish from the oceans

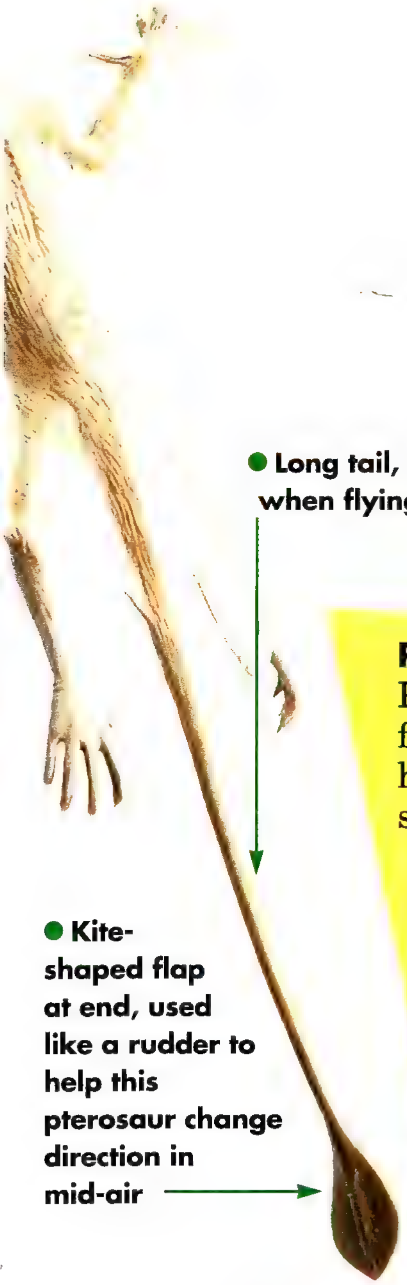
● Long neck

● Broad wings were used to glide over the oceans

● Few or no teeth

● Short tail

'WING FINGERS'
- Later group
- Few teeth
- Very small tail
- Large crest on head



Rhamphorhynchus

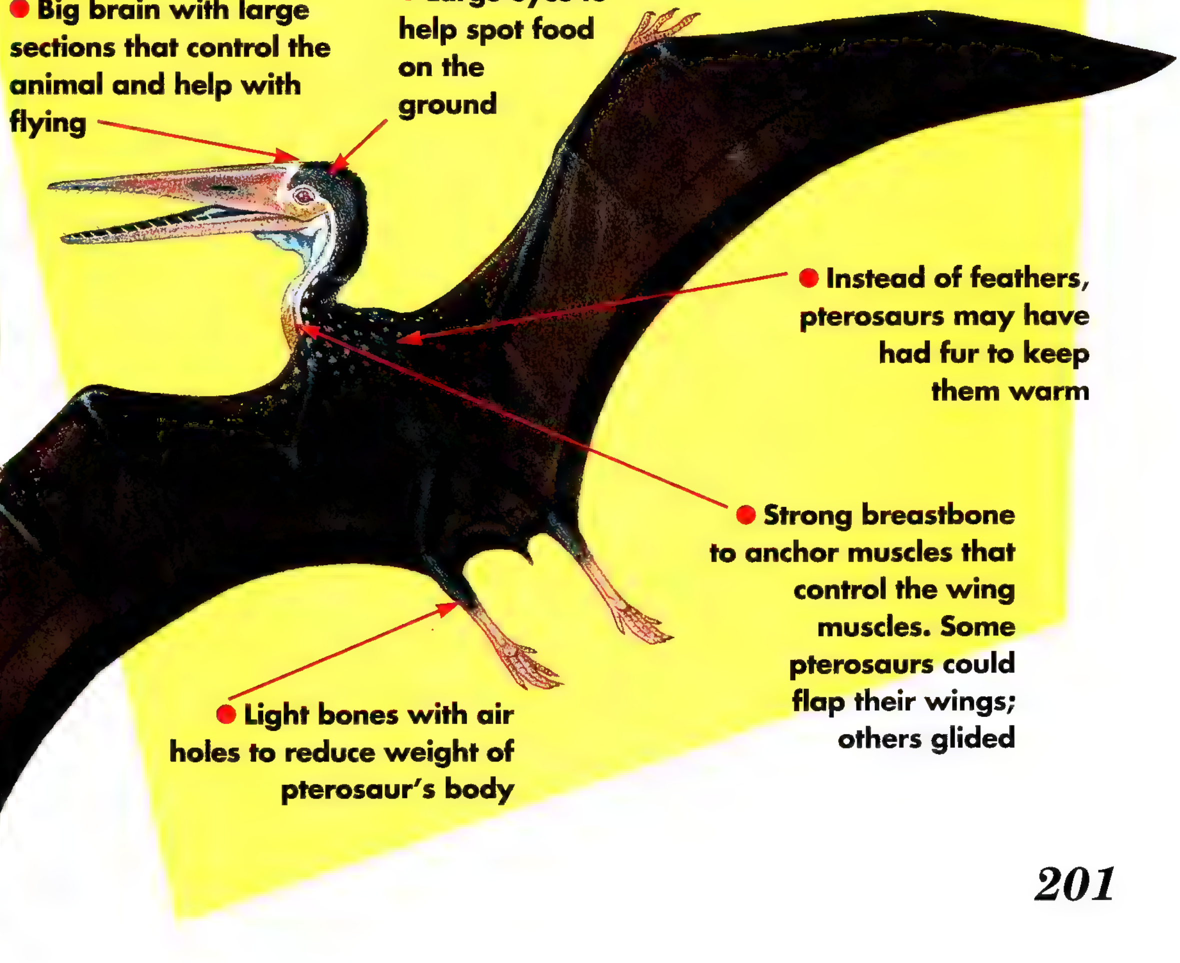
- **More elongated head than later pterosaurs**
- **Long tail, held out straight when flying**
- **Kite-shaped flap at end, used like a rudder to help this pterosaur change direction in mid-air**

BALANCING ACT

Pteranodon had a large crest on the back of its head. This may have been used to help with balance. With such a large, heavy beak, *Pteranodon* needed the crest to weigh down the back of its head. Some experts think that the bony part of the crest was used as a 'mast'. It may have supported a flap of skin behind it, which would have acted like a 'sail' or 'rudder' to steer the pterosaur through the air.

READY FOR TAKE OFF

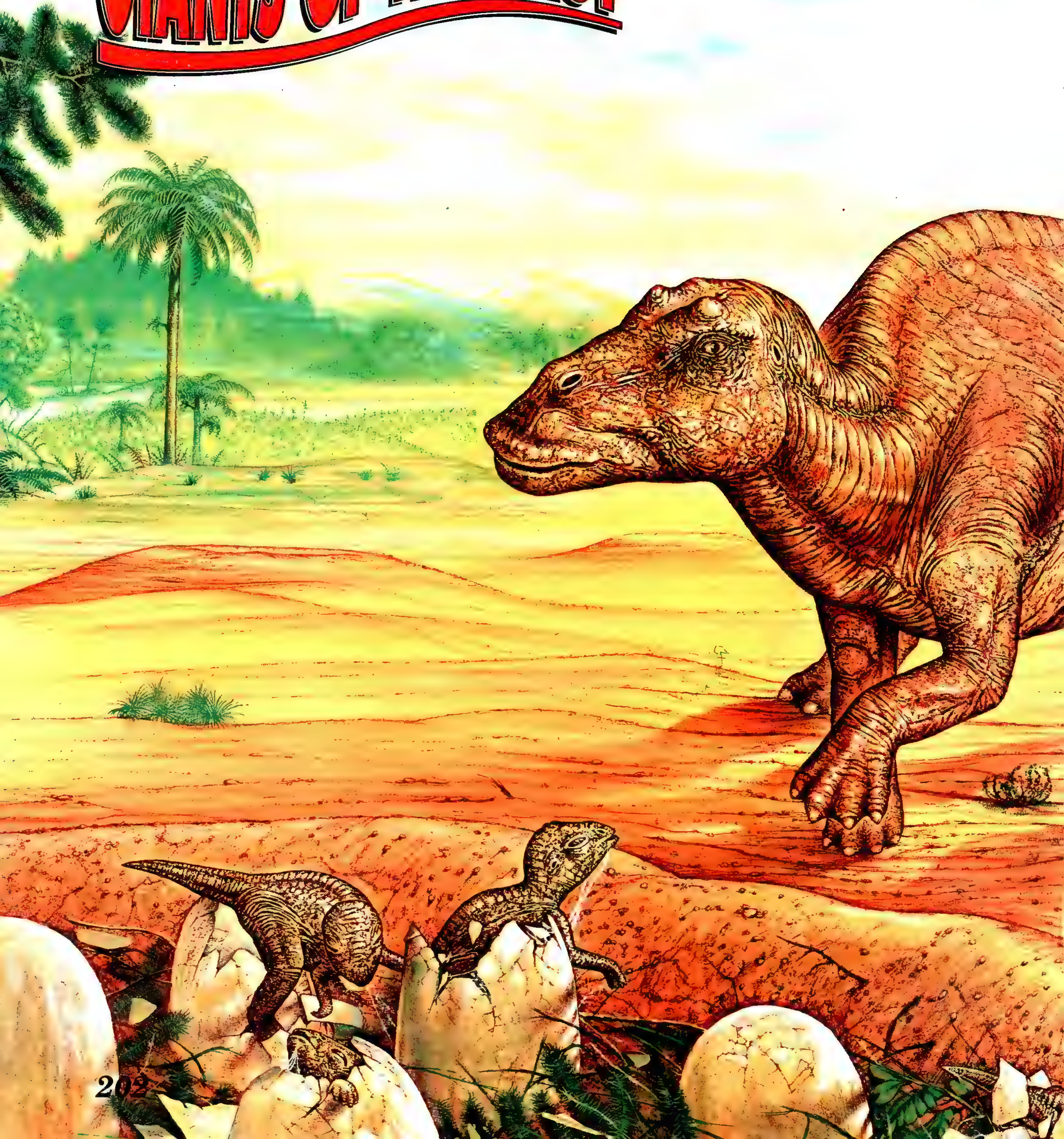
Pterosaurs were not related to birds but their bodies were designed for flying, just like birds. For example, they had strong breastbones, hollow limb bones and very good eyesight. Can you spot any other similarities between pterosaurs and birds?



- **Big brain with large sections that control the animal and help with flying**
- **Large eyes to help spot food on the ground**
- **Instead of feathers, pterosaurs may have had fur to keep them warm**
- **Strong breastbone to anchor muscles that control the wing muscles. Some pterosaurs could flap their wings; others glided**
- **Light bones with air holes to reduce weight of pterosaur's body**

Pterodactylus

GIANTS OF THE PAST



MAIASAURA

Four baby *Maiasaura* hatch from their eggs and take a first look at the world. They will stay near to the nest until they are old enough to look for their own food. One parent keeps an eye out for danger, while the other looks around for some food to feed the newly-hatched dinosaurs. *Maiasaura* had large families, there may be as many as 30 eggs in this nest.

3-D Gallery

17

DEINONYCHUS FAMILY

- Well-armed hunter
- Lived 115 million years ago in North America
- Adults measured 3m long and 2m tall
- Ate other dinosaurs

3-D Gallery

18

STRUTHIOMIMUS

- Ostrich-like predator
- Lived 80 – 60 million years ago in Western North America
- Measured 3 – 4m long
- Ate insects, lizards and plants

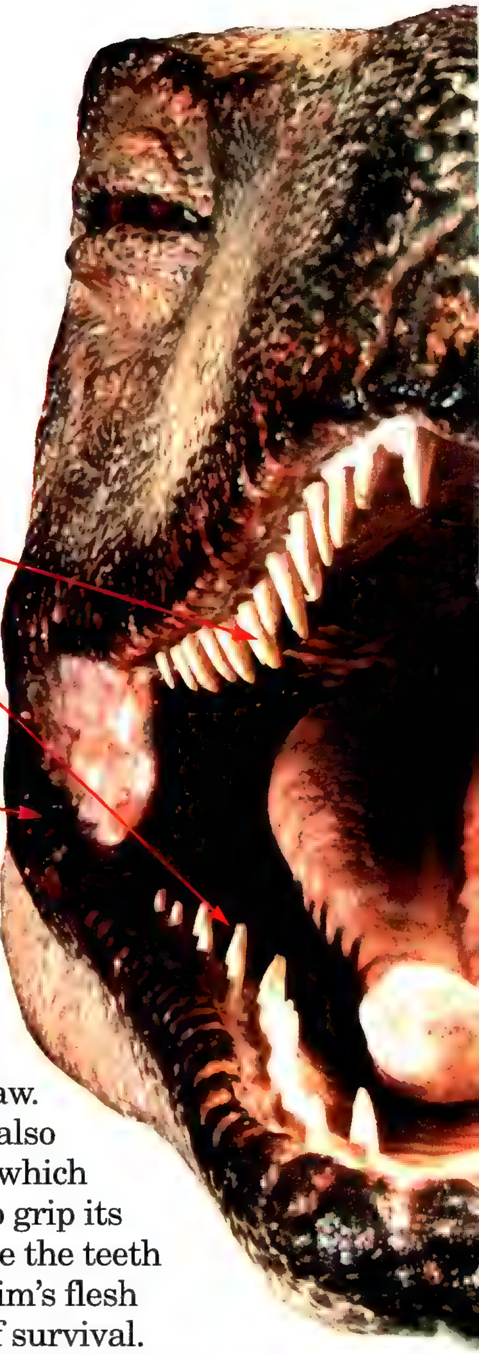
Open wide

Sharp as razors, serrated like saws, or leaf shaped, dinosaur teeth can tell us a lot about how dinosaurs lived.

If a jaw, studded with pointed fangs is uncovered by scientists on a dig, they can tell that these teeth did not belong to a peaceful vegetarian – but a blood-thirsty carnivore.

LOOK SHARP!

Unlike humans, who have to look after their teeth to avoid a trip to the dentist, meat-eating dinosaurs, such as *Allosaurus*, could afford to ignore their teeth. As one tooth broke or fell out another automatically grew in its place.



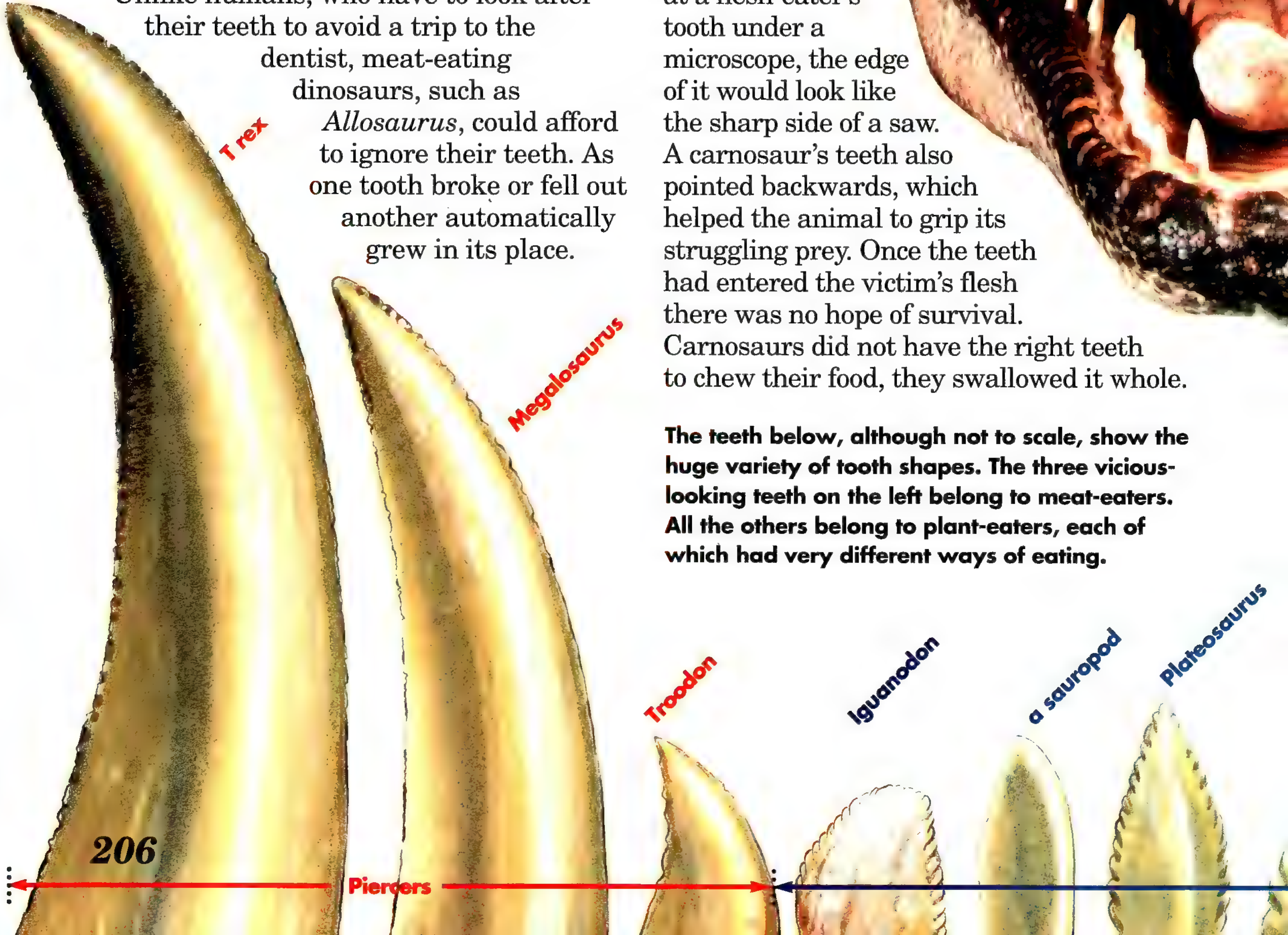
DEINONYCHUS

- **Sharp teeth pointing backwards**
- **New teeth ready to replace old or damaged ones**
- **Strong jaws**

PIERCING FANGS

If you were to look at a flesh-eater's tooth under a microscope, the edge of it would look like the sharp side of a saw. A carnosaur's teeth also pointed backwards, which helped the animal to grip its struggling prey. Once the teeth had entered the victim's flesh there was no hope of survival. Carnosaurs did not have the right teeth to chew their food, they swallowed it whole.

The teeth below, although not to scale, show the huge variety of tooth shapes. The three vicious-looking teeth on the left belong to meat-eaters. All the others belong to plant-eaters, each of which had very different ways of eating.



PEACEFUL PLANT EATERS

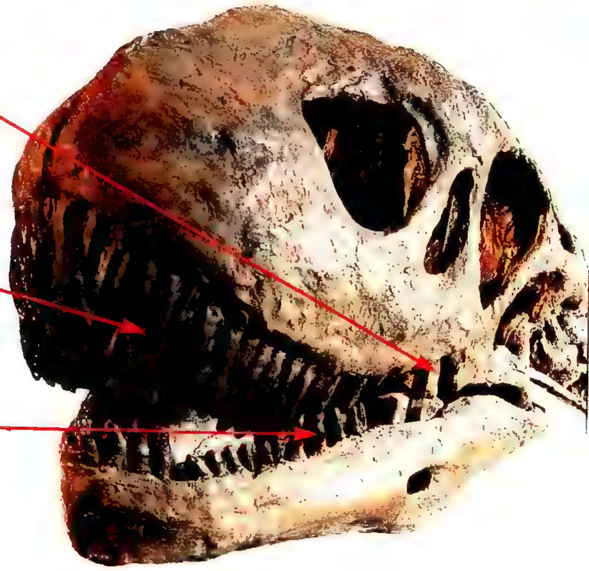
The vegetarians of the dinosaur world had very efficient teeth to cope with their leafy diet. Like today's sheep and horses, herbivorous dinosaurs had teeth that were designed for stripping branches, chopping, and grinding tough plants.

RAKING UP LEAVES

Some dinosaurs, such as *Diplodocus* and *Shunosaurus*, did not have any chewing teeth. Instead, they simply raked leaves from twigs using pencil-shaped teeth and swallowed the leaves whole. All the hard work was done by the stomach, where the vegetation was broken down.

CHOPPERS

Ornithopods, such as *Heterodontosaurus,* were able to chop their food up. Their lower jaws rotated in and out as they opened and closed their mouth. Later ornithopods could also chew. Behind *Iguanodon's* horny beak and muscley cheeks were rows of sharp teeth. These met at an angle, interlocking tightly to help *Iguanodon* chew its food.



SHUNOSAURUS

- **Weak jaws**
- **Pencil-shaped teeth used to rake leaves off branches**
- **Teeth not designed for chewing**

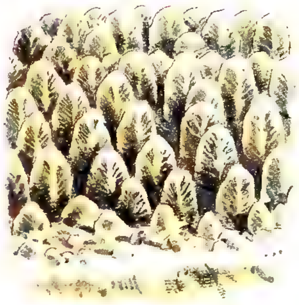
A SLICING EDGE

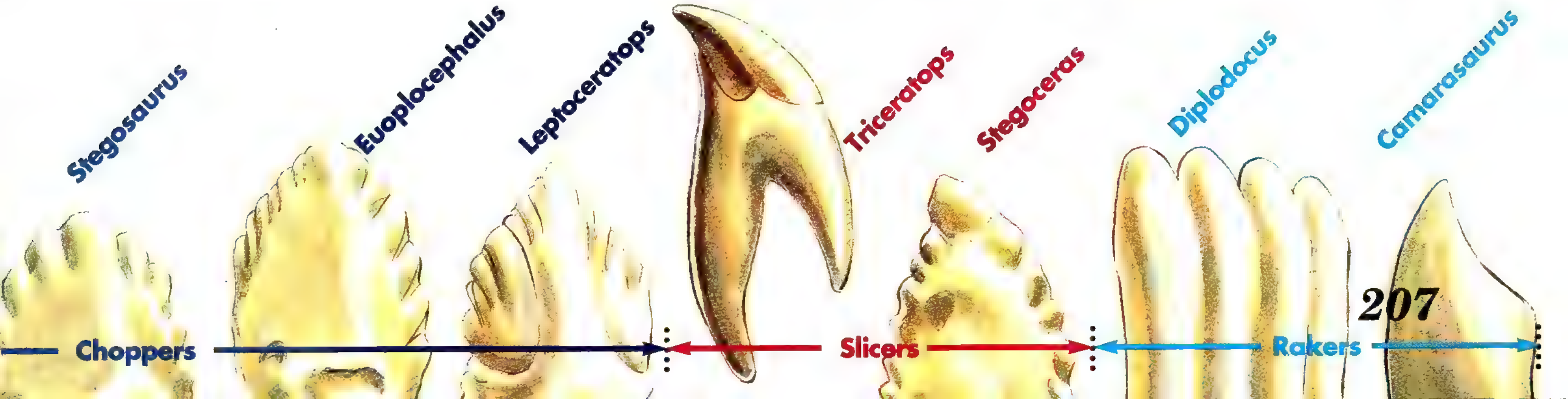
Inside *Triceratops'* mouth were hundreds of teeth. They were anchored to the jaw by interlocking, 'V'-shaped roots. As *Triceratops* closed its mouth, the upper and lower teeth moved like a pair of garden shears – slicing the food into pieces that were small enough to swallow.

Is it true

that some dinosaurs had as many as 1000 teeth?

Edmontosaurus was a duckbilled dinosaur. It had about 1000 strong teeth, which were used to grind vegetation into a pulp. The teeth were cemented together to form solid walls on the top and bottom jaws (right). As the dinosaur chewed, the walls met and crushed the vegetation.





Bringing up baby

What happened to baby dinosaurs once they had hatched out of their eggs? Did they fend for themselves, or did their parents look after them? Follow the clues to find out.

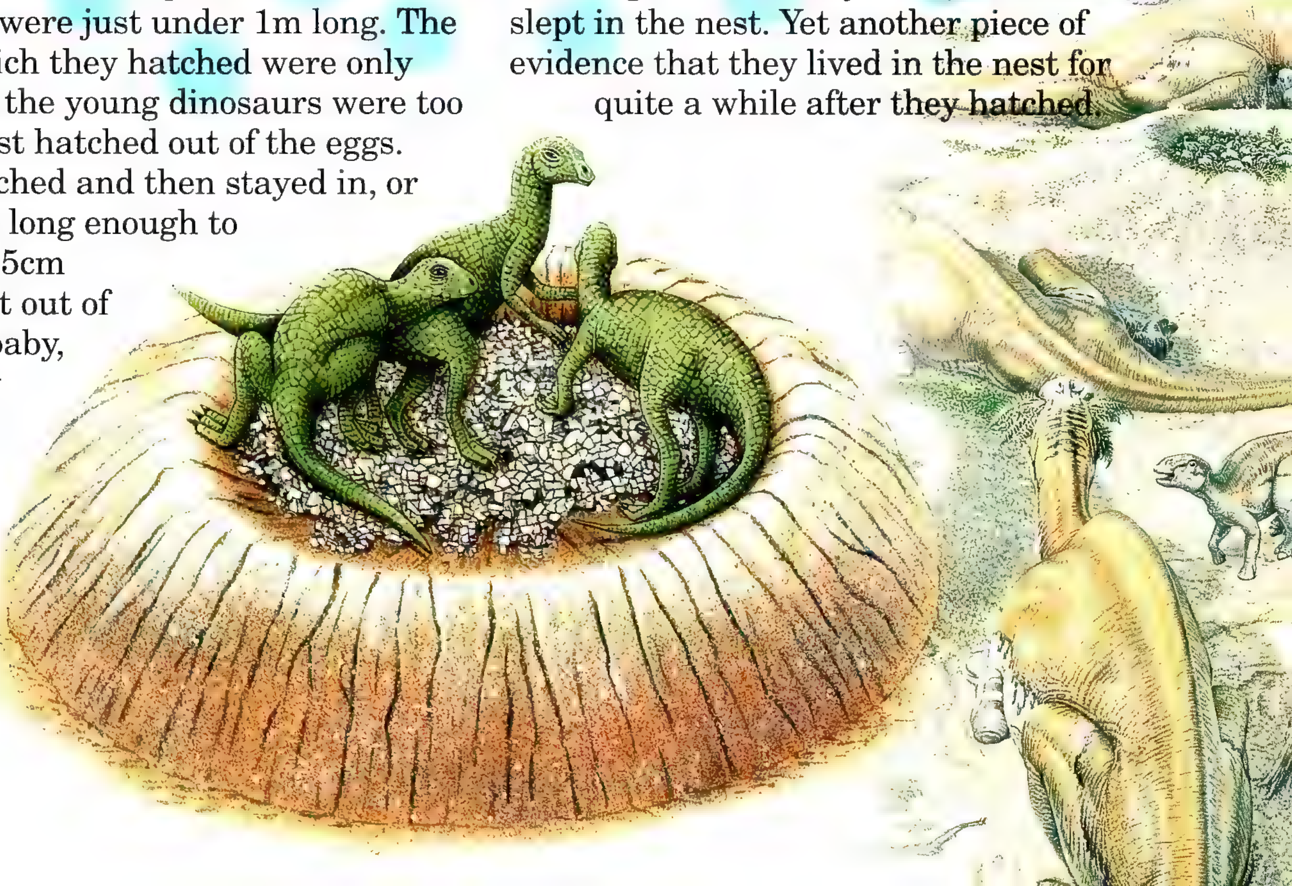
In 1978, a whole nest of baby dinosaurs and their eggshells were discovered in Montana in the USA. The fossils of such young dinosaurs are rare and these little hadrosaurs were even more unusual because their skeletons, together with their nest and eggshells, gave the experts the first ever clues to how some young dinosaurs were looked after.

CLUE 1

The skeletons of the young hadrosaurs, found in the bowl-shaped mud nest, were just under 1m long. The eggs from which they hatched were only 20cm long, so the young dinosaurs were too big to have just hatched out of the eggs. They had hatched and then stayed in, or near, the nest long enough to grow from a 35cm hatchling, just out of the egg, to a baby, 1m long. Why did they stay in the nest? Experts think that they stayed to be looked after by their parents.

CLUE 2

The eggshells in the nest were all in little pieces. Why? The experts believe that the baby dinosaurs trampled their eggshells into fragments as they moved around and slept in the nest. Yet another piece of evidence that they lived in the nest for quite a while after they hatched.



CLUE 3

When the palaeontologists studied the skulls of the little dinosaurs they discovered that the teeth were worn down by grinding food. It seems that the young hadrosaurs had been brought food in the nest by their parents, just as today's birds do.

CLUE 4

The young dinosaurs had died in their nests. It seems that their parents must have died or been killed and did not return to the nest to feed them. The little dinosaurs' instinct was to stay in the nest whatever happened. Even though they were very hungry, they stayed in the nest waiting for their parents to return. When their parents did not come back to feed them they eventually died of starvation. The palaeontologists saw this as clear evidence that some dinosaurs cared for their young and even looked after them so well that they collected food and returned to the nest to feed them.

CLUE 5

The palaeontologists discovered many other nests around the first nest. The whole area was a hadrosaur nesting site. The experts believe that these dinosaurs nested close together for protection against predators. By nesting near each other, there was always an adult dinosaur around to keep an eye open for egg thieves or ferocious meat-eating dinosaurs.

ALL IN A NAME

Experts named the dinosaur *Maiasaura*, or 'good mother lizard', because it took care of its young.

HELPLESS BABIES

Although some dinosaurs were very large animals, they did not lay large eggs. The biggest eggs found so far are only about 30cm long. This means that when some baby dinosaurs hatched they must have been very small and defenceless creatures. The hatchlings of certain dinosaur species were so helpless that they were unable to look after themselves. They had to rely on their parents until they had grown enough to have some chance of survival.

A green iguana, a reptile of today, hatches. It will fend for itself immediately.

A tiny hadrosaur emerges from its egg. This fossil model shows how helpless some hatchlings were.

FEND FOR YOURSELF!

Other dinosaurs did not take care of their young. Just like some modern reptiles, they abandoned their eggs and left their young to hatch by themselves. Once they had hatched, the young dinosaurs had to fend for themselves. Although many must have died, some of them managed to survive to become adults.

TIME DETECTIVE

***Protoceratops* adults protected young members of their herd. Here, newly hatched, juvenile and adult *Protoceratops* live together.**

PART OF THE CROWD

Some dinosaurs, however, looked after their young as soon as they hatched. Palaeontologists have found many skeletons of adult, young and hatchling *Protoceratops* together proving that they lived together in mixed age groups. The adult dinosaurs scared predators away and protected the younger ones.

IT'S A FACT

BIG EGGS

Dinosaur eggs were not that big. Large eggs would have needed thick shells to prevent them from collapsing. The eggs of small dinosaurs were about the size of chickens' eggs. The largest dinosaur eggs known so far were laid by *Hypselosaurus*. They were up to 30cm long. An ostrich egg, which is the largest egg of any living animal, is about 15 – 20cm.

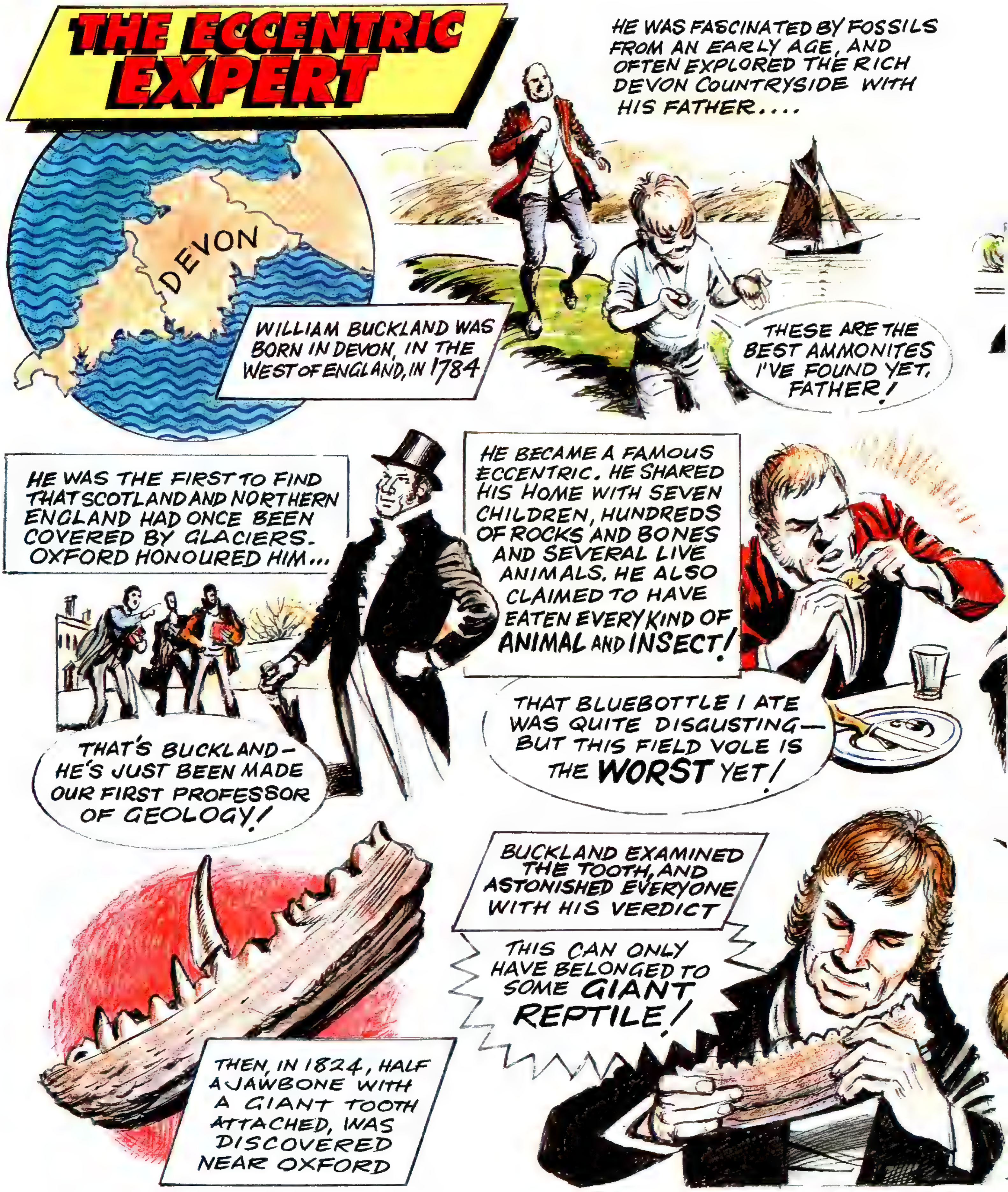
GENTLE AS AN ALLIGATOR

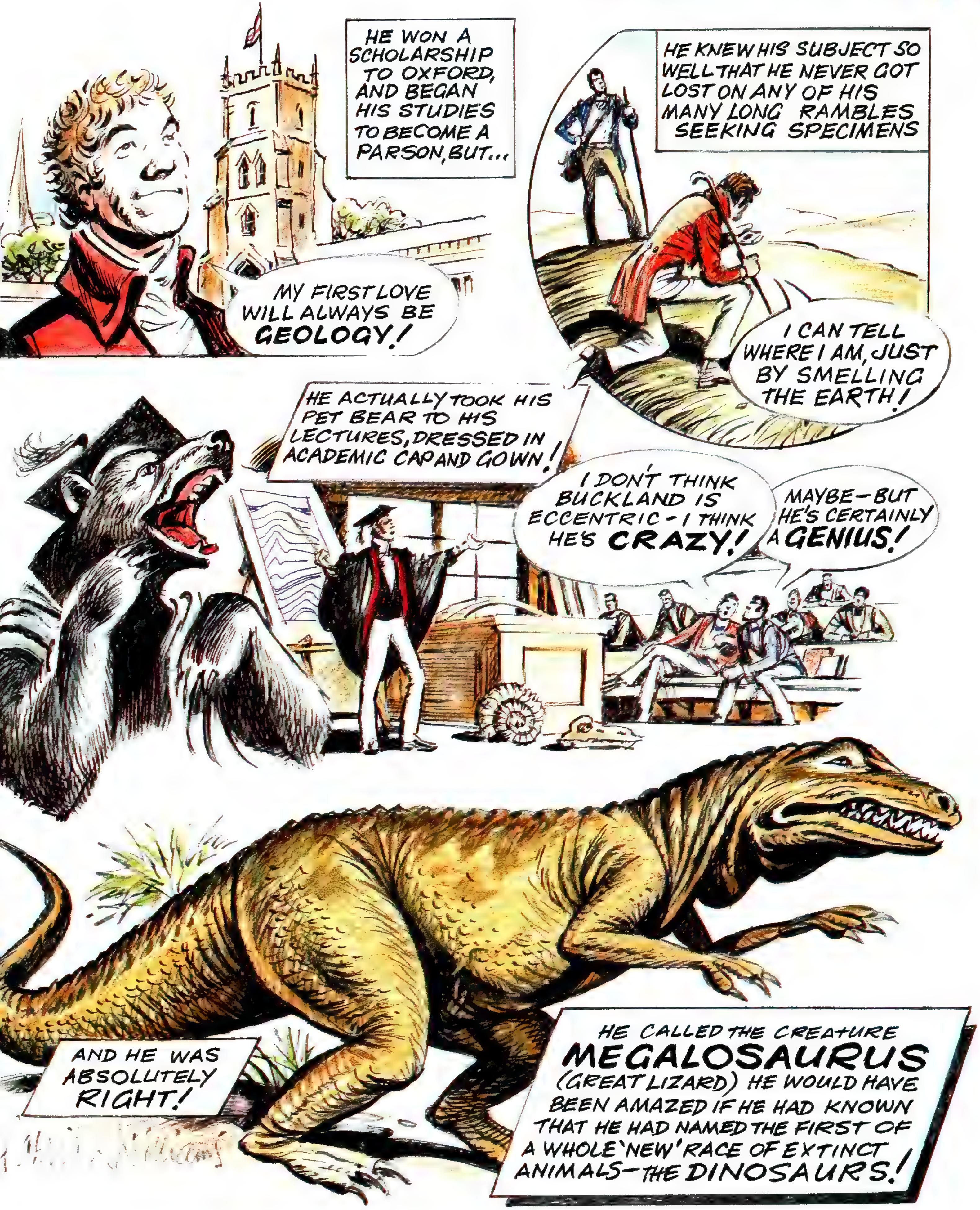
Some experts are not sure that a creature as huge as a dinosaur could have looked after something as small as one of its own young without trampling it to death. But, the alligator, one of today's biggest reptiles and a distant relative of the dinosaurs, looks after its tiny young very carefully.

When the young hatch they call their mother with high-pitched grunts and she comes to help them. She digs them out of the nest and carries them to a special nursery pool that she has made for them. She can bite through a human leg with her huge jaws and razor sharp teeth, but her own young are perfectly safe in her care. So it seems likely that dinosaurs were able to look after their young, too.

An American alligator hatchling perches on its mother's head, just above her eyes. It is only a few centimetres away from her fearsome teeth, but it is perfectly safe. American alligators may care for their young for up to two years.

THE ECCENTRIC EXPERT


DEVON
WILLIAM BUCKLAND WAS BORN IN DEVON, IN THE WEST OF ENGLAND, IN 1784
HE WAS FASCINATED BY FOSSILS FROM AN EARLY AGE, AND OFTEN EXPLORED THE RICH DEVON COUNTRYSIDE WITH HIS FATHER....
THESE ARE THE BEST AMMONITES I'VE FOUND YET, FATHER!
HE WAS THE FIRST TO FIND THAT SCOTLAND AND NORTHERN ENGLAND HAD ONCE BEEN COVERED BY GLACIERS. OXFORD HONOURED HIM...
THAT'S BUCKLAND - HE'S JUST BEEN MADE OUR FIRST PROFESSOR OF GEOLOGY!
HE BECAME A FAMOUS ECCENTRIC. HE SHARED HIS HOME WITH SEVEN CHILDREN, HUNDREDS OF ROCKS AND BONES AND SEVERAL LIVE ANIMALS. HE ALSO CLAIMED TO HAVE EATEN EVERY KIND OF ANIMAL AND INSECT!
THAT BLUEBOTTLE I ATE WAS QUITE DISGUSTING - BUT THIS FIELD VOLE IS THE WORST YET!
THEN, IN 1824, HALF A JAWBONE WITH A GIANT TOOTH ATTACHED, WAS DISCOVERED NEAR OXFORD
BUCKLAND EXAMINED THE TOOTH, AND ASTONISHED EVERYONE WITH HIS VERDICT
THIS CAN ONLY HAVE BELONGED TO SOME GIANT REPTILE!


HE WON A SCHOLARSHIP TO OXFORD, AND BEGAN HIS STUDIES TO BECOME A PARSON, BUT...
MY FIRST LOVE WILL ALWAYS BE GEOLOGY!
HE KNEW HIS SUBJECT SO WELL THAT HE NEVER GOT LOST ON ANY OF HIS MANY LONG RAMBLES SEEKING SPECIMENS
I CAN TELL WHERE I AM, JUST BY SMELLING THE EARTH!
HE ACTUALLY TOOK HIS PET BEAR TO HIS LECTURES, DRESSED IN ACADEMIC CAP AND GOWN!
I DON'T THINK BUCKLAND IS ECCENTRIC - I THINK HE'S CRAZY!
MAYBE - BUT HE'S CERTAINLY A GENIUS!
HE CALLED THE CREATURE MEGALOSAURUS (GREAT LIZARD) HE WOULD HAVE BEEN AMAZED IF HE HAD KNOWN THAT HE HAD NAMED THE FIRST OF A WHOLE 'NEW' RACE OF EXTINCT ANIMALS - THE DINOSAURS!
AND HE WAS ABSOLUTELY RIGHT!

Improve and test your knowledge with...

DINO Fact File

Climb down *Diplodocus'* neck answering the questions as you go.

3 What does pterodactyloid mean?

a) the type with wide beaks
b) the type with wing fingers
c) the type that could fly

4 What was the frill on the back of *Chasmosaurus'* neck used for?

a) to protect it from attackers
b) to keep the sun off its neck
c) to imitate other dinosaurs

5 What or who was *Quetzalcoatlus* named after?

a) a Roman emperor
b) an American Indian god
c) a Mexican river

6 What shape were *Diplodocus'* teeth?

a) pencil-shaped
b) knife-shaped
c) fork-shaped

7 How big is the largest known dinosaur egg?

a) up to 30cm long
b) up to 3m long
c) up to 3cm long

8 What were pterosaurs' wings made of?

a) muscle and bone
b) skin
c) feathers

9 Where did *Huayangosaurus* have spikes?

a) on its tail and shoulders
b) on its head and back
c) on its bottom

10 Why did families of *Protoceratops* live together?

a) they enjoyed the company
b) it was safer
c) they were not very adventurous

Dinosaur tales

Many science-fiction books have been written about dinosaurs since their discovery. Some, like Jules Verne's 'Journey To The Centre of the Earth', and Edgar Rice Burrows' 'The Land That Time Forgot', have been made into successful films.

Guess work

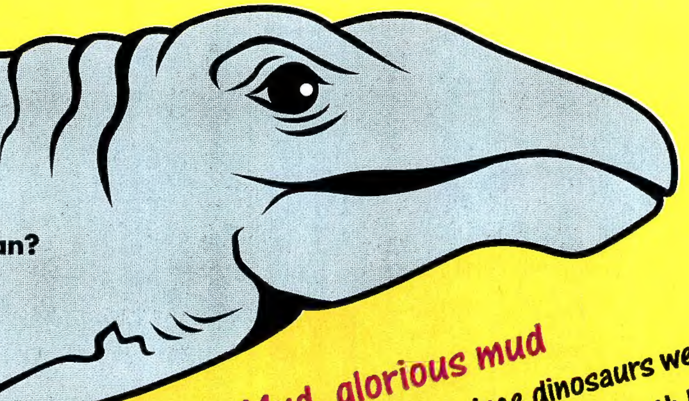
There are over 1000 species of dinosaur. Some are based only on a tooth or fragment of bone. There are around 150 'good' dinosaurs – ones which have either full skeletons or enough bones to make a very good guess at what they looked like.

Smallest brain

The giant sauropod Diplodocus had the smallest brain, compared to the size of its body, of all the dinosaurs.

Dinosaur dollars

Millionaire Andrew Carnegie spent $25 million in just 10 years, between 1895 and 1905, on the collection of dinosaur bones and fossils. Life-size plaster casts of all skeletons found were made and given to museums around the world.



2 **What did *Huayangosaurus* eat?**
- a) other dinosaurs
- b) small pterosaurs
- c) soft, juicy plants

1 **What does *Maiasaura* mean?**
- a) earth mother
- b) egg carrier
- c) good mother lizard

Mud, glorious mud

Millions of years have passed since dinosaurs were around. During this time, the face of the Earth has changed and dinosaurs' bones have become buried under layers of mud and rock. These layers of mud may be over eight kilometres deep.

A pack of killers

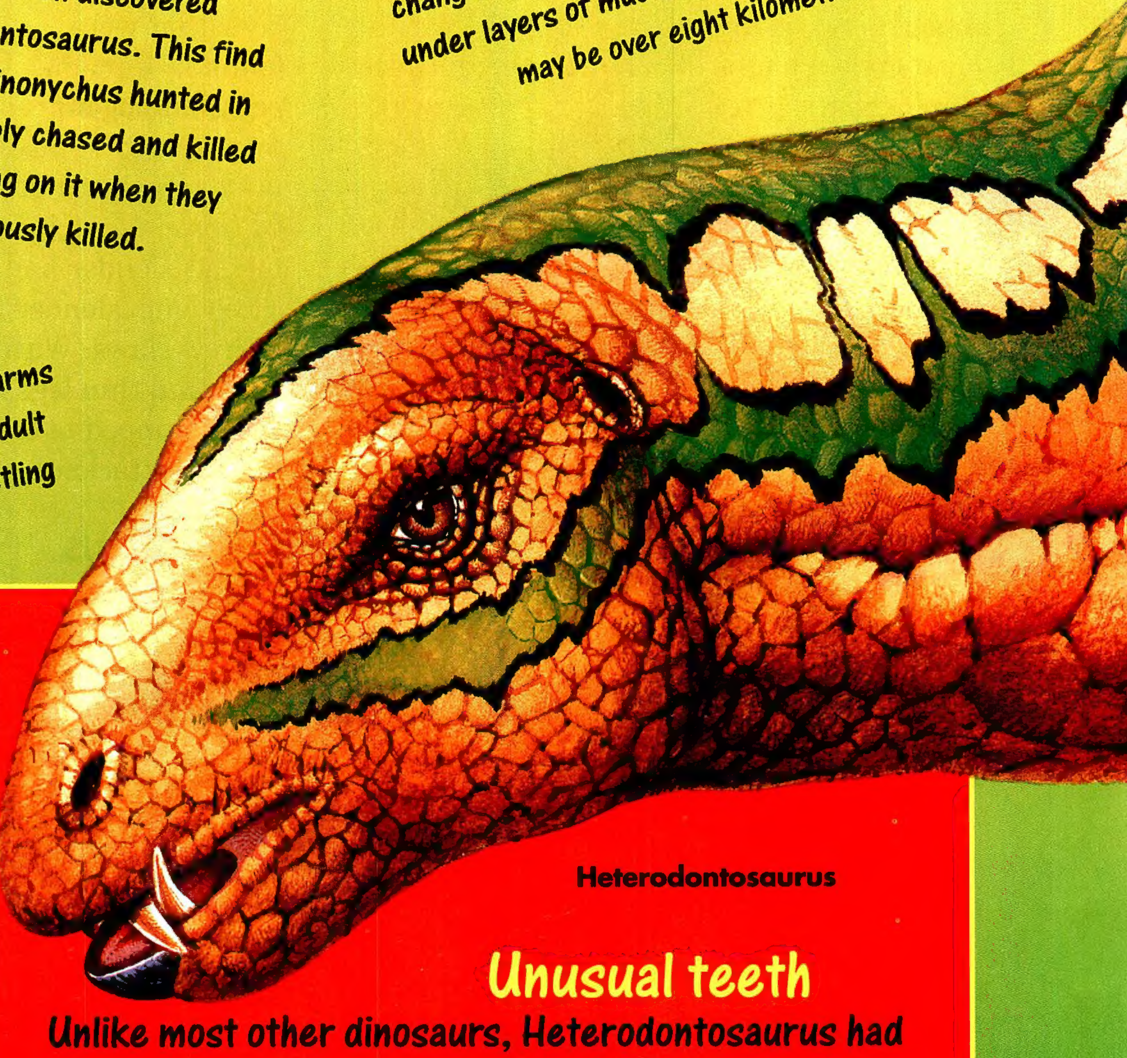
Deinonychus skeletons have been discovered surrounding the remains of Tenontosaurus. This find led scientists to believe that Deinonychus hunted in packs. Some Deinonychus probably chased and killed Tenontosaurus and were feeding on it when they themselves were mysteriously killed.

Five tonne weakling

As some tyrannosaurs evolved, their arms became weaker. An average-sized adult human could have won an arm-wrestling contest with a huge T rex!

Hello, hello, hello

In 1977, an amateur fossil-hunting policeman found tail bones belonging to an animal like Diplodocus in Cretaceous rock on the Isle of Wight. It was an amazing find. Scientists had previously believed that Diplodocus and its relatives lived only in the USA during the Jurassic.



Heterodontosaurus

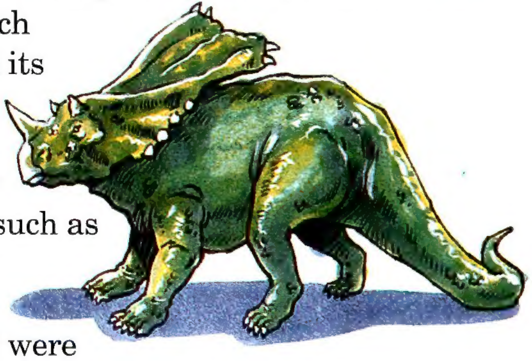
Unusual teeth

Unlike most other dinosaurs, Heterodontosaurus had three very different types of teeth. They were sharp cutting teeth at the front, fangs to either side of these cutting teeth, and broad teeth for crushing food along the sides of their jaws.

Answers to the questions on inside back cover

CHASMOSAURUS 80 MYA

This plant-eater walked on all fours through what is now North America. *Chasmosaurus* (kaz-moe-saw-rus) was 5.2m long (the length of two small cars), and weighed almost as much as two rhinoceroses. At the back of its head grew a long frill of bone, covered with skin, which protected its neck from attack by enemies such as *T rex*. Over its eyebrows were two horns, which *Chasmosaurus* used to fight rivals.



CHIALINGOSAURUS 150 MYA

As long as a car (4m) and more slender than some members of its family, *Chialingosaurus* (chy-lin-go-saw-rus) had long forelimbs and two rows of spiky plates along its back and tail. These acted as protective armour. *Chialingosaurus* lived near, and is named after, the Chia-ling river in southern China. It was a stegosaur and ate plants.

CHILANTAISAURUS 80 MYA

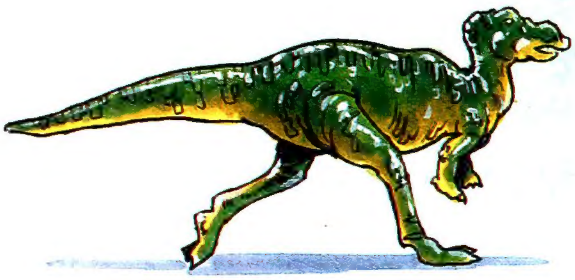
Also from China, *Chilantaisaurus* (chy-lan-tay-saw-rus) was related to *Allosaurus.* It was a fearsome two-legged meat-eater. This large animal weighed more than two rhinoceroses. It had massive arms and clawed, three-fingered hands with which to grab its victims.

CHIROSTENOTES 80 MYA

From a pair of hands, some teeth and a jaw bone that were found in Canada, palaeontologists managed to piece together a dinosaur they called *Chirostenotes* (chy-ros-ten-o-tees). The name means 'slender hands'. *Chirostenotes* had three long, slender fingers armed with long, narrow claws. With its small body (just 2m long) and thin legs, *Chirostenotes* was well equipped to escape quickly from hungry attackers.

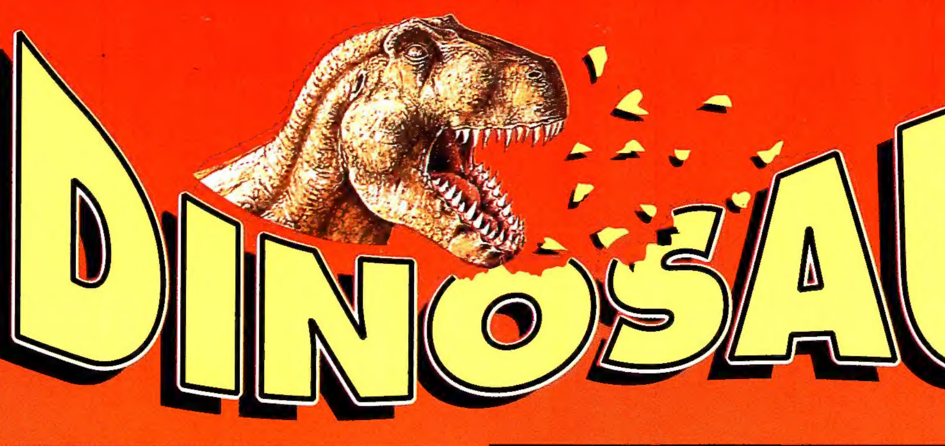
CLAOSAURUS 80 MYA

Claosaurus (clay-oh-saw-rus), whose name means ' broken lizard', was a hadrosaur. It came from Kansas, USA, and was one of the earliest duckbilled dinosaurs. *Claosaurus* walked and ran on its two long hind legs. Only 3.7m long, it had a mouth full of small, ridged teeth, closely packed together to enable it to chew tough, woody plants.



MYA = MILLION YEARS AGO

COMING IN PART 10 OF

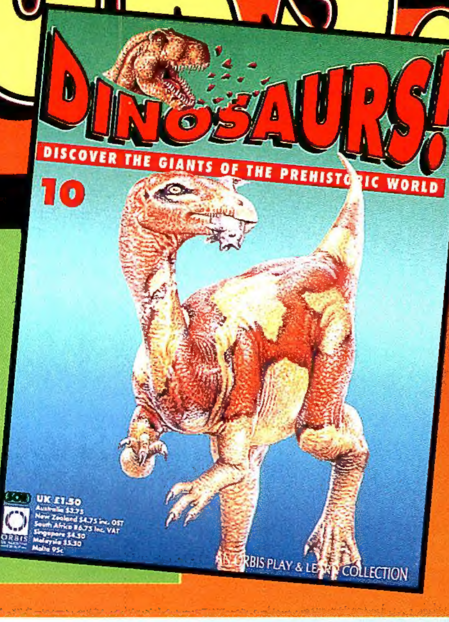


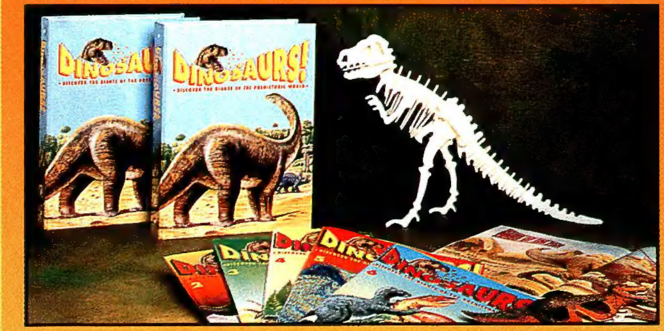
IDENTIKIT looks at *Stegoceras*, a prehistoric head-butter, giant *Apatosaurus* and *Segnosaurus*. AND: Meet some spiky characters in SPOTTER'S GUIDE.

PLUS

DINOSAUR MODEL: The next two pieces for your *T rex* body model.

And
HISTORY IN PICTURES
TIME DETECTIVE
DINOSAUR WORLD


DINOSAURS!
DISCOVER THE GIANTS OF THE PREHISTORIC WORLD
10
UK £1.50
ORBIS PLAY & LEARN COLLECTION



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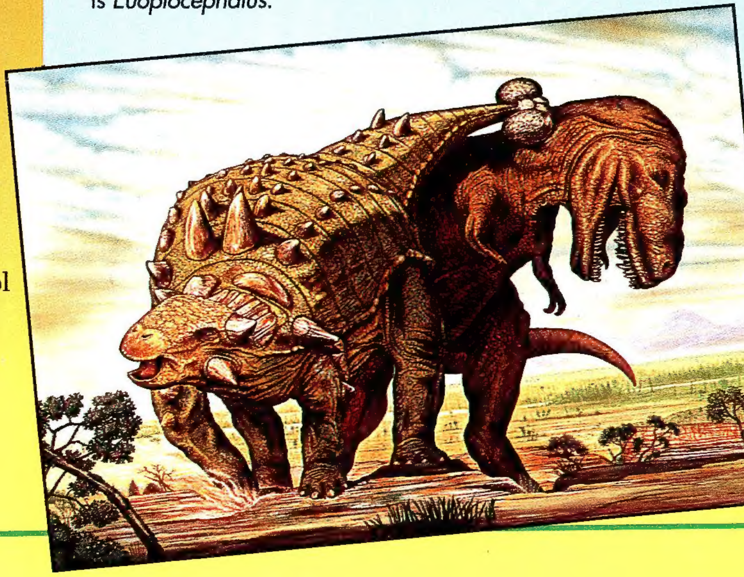
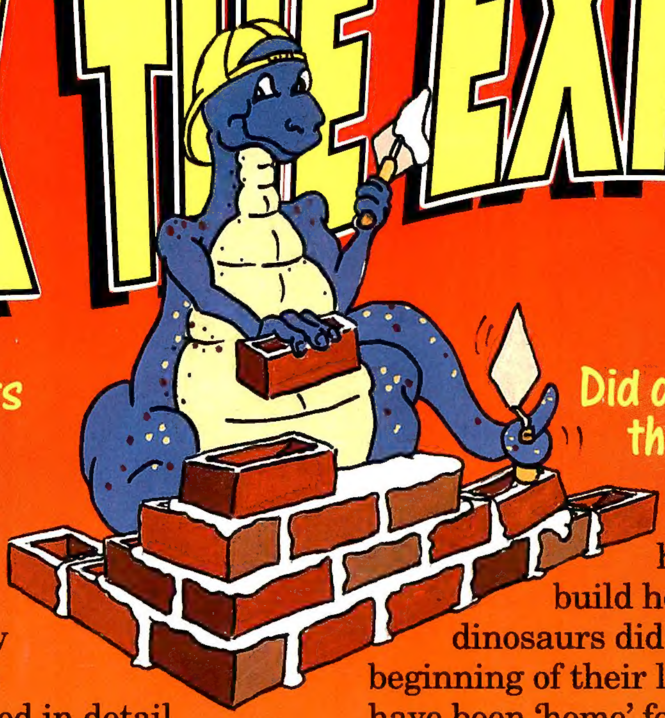
THE DINOSAURS! POSTER COLLECTION

Have you ever wanted to fill your room with dinosaurs? Now you have your chance – with the *Dinosaurs!* POSTER COLLECTION. Each poster is a 820 x 570mm (nearly eight times the size of this page) and features a superb dinosaur artwork. You'll find facts and figures about the dinosaur on the back – PLUS a look at some other prehistoric animals. The fourth poster is *Euoplocephalus*.



ASK THE EXPERT

Dr. David Norman of Cambridge University answers your dinosaur questions

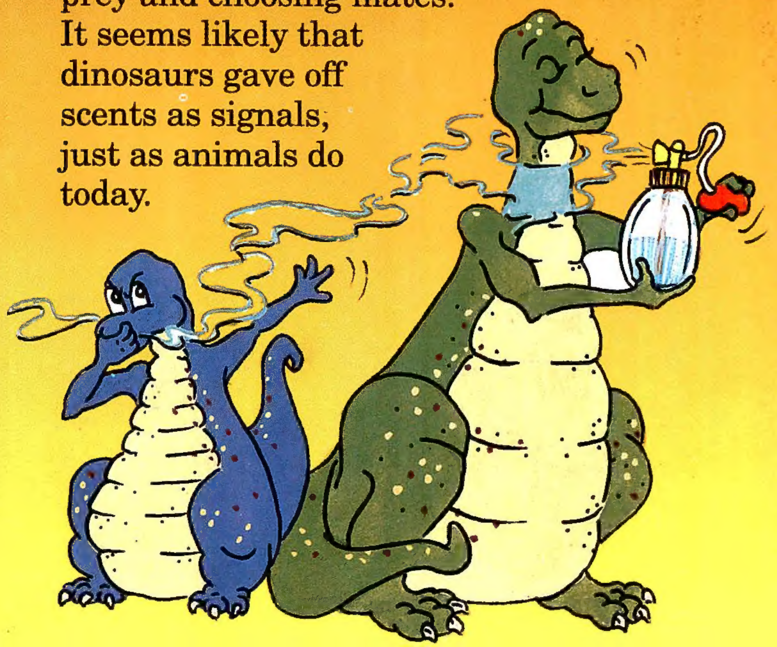


Who gave dinosaurs their names?

Since the 1820s, dinosaur names have been invented by palaeontologists. Every time a new dinosaur is discovered it is described in detail in a scientific journal. To show that this is a brand new specimen, experts choose a name that has never been used before and that gives a clue to how, or where, the fossils were found.

Would dinosaurs have smelt of anything?

Many dinosaurs had extremely sensitive noses. A keen sense of smell would have been important for sniffing out predators, prey and choosing mates. It seems likely that dinosaurs gave off scents as signals, just as animals do today.



Did dinosaurs build themselves homes?

Most dinosaurs would have been too big to build homes. However, some dinosaurs did build nests. At the beginning of their lives, these nests would have been 'home' for baby dinosaurs.

Is there any part of the world where dinosaurs didn't live?

Dinosaur remains have been found in all the major continents of the world. Until very recently, dinosaurs were thought not to have lived in Antarctica. But within the last 10 years, fossils belonging to an armoured dinosaur and a small two-footed plant-eating dinosaur have been found on the rocky outskirts of this frozen continent.

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